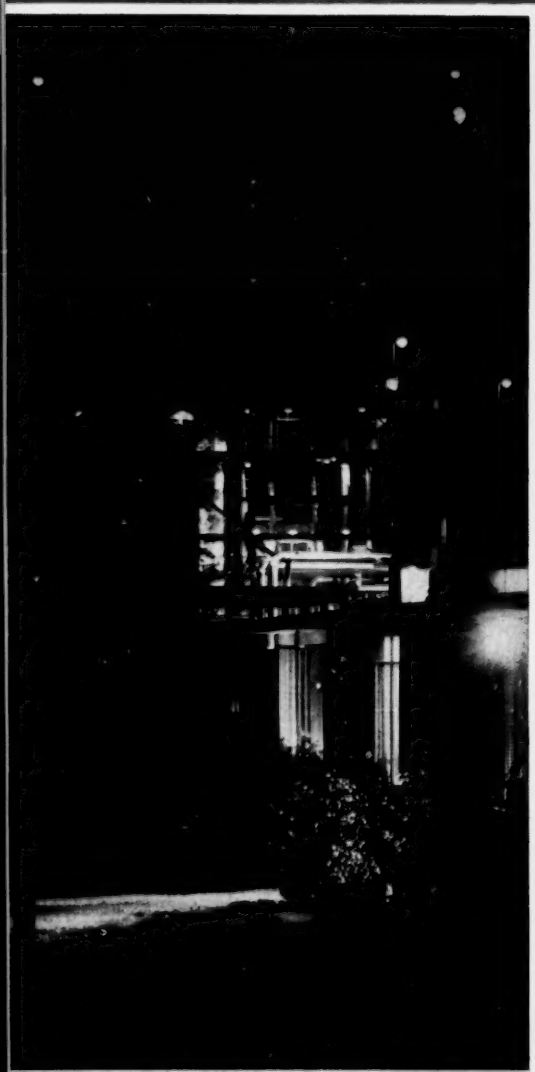


Chemical Week

December 21, 1957

Price 35 cents



30% lithium chemical price cut
will squeeze producers' profit
margins p. 20

Season's greetings from the CPI.
Chemical plants across the nation
capture Christmas spirit . . . p. 36

Target a good glue for pallets
and boxes. Incentive—8-million-
lbs./year market p. 41

Antitrust public relations are
tough to handle. Here are three ex-
perience-proved techniques . p. 29

Specialties makers meet in
Florida, scan outlook for business
in '58 p. 48



Coming Soon... More H_2O_2 for a Growing Industry

A new Shell Chemical plant—soon to be on stream at Norco, Louisiana—will help fill the requirements of the rapidly expanding H_2O_2 market. This important new source represents a considerable increase in the national capacity, timed to coincide with expanding developments in hydrogen peroxide chemistry.

In addition to its time-honored application as a textile and pulp bleach, H_2O_2 is finding increasing uses in chemical oxidation, epoxi-

dation and as a chemical intermediate.

To assist you in using hydrogen peroxide, Shell Chemical offers to share its technical experience. Laboratory facilities and a field staff are at your disposal. As a major consumer of hydrogen peroxide, Shell Chemical also can assist you with storage and handling problems.

Your Shell Chemical representative will be glad to consult with you on your H_2O_2 problems. Write to:

SHELL CHEMICAL CORPORATION

CHEMICAL SALES DIVISION, 380 Madison Avenue, New York 17, New York

Atlanta • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco • St. Louis
IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited • Montreal • Toronto • Vancouver



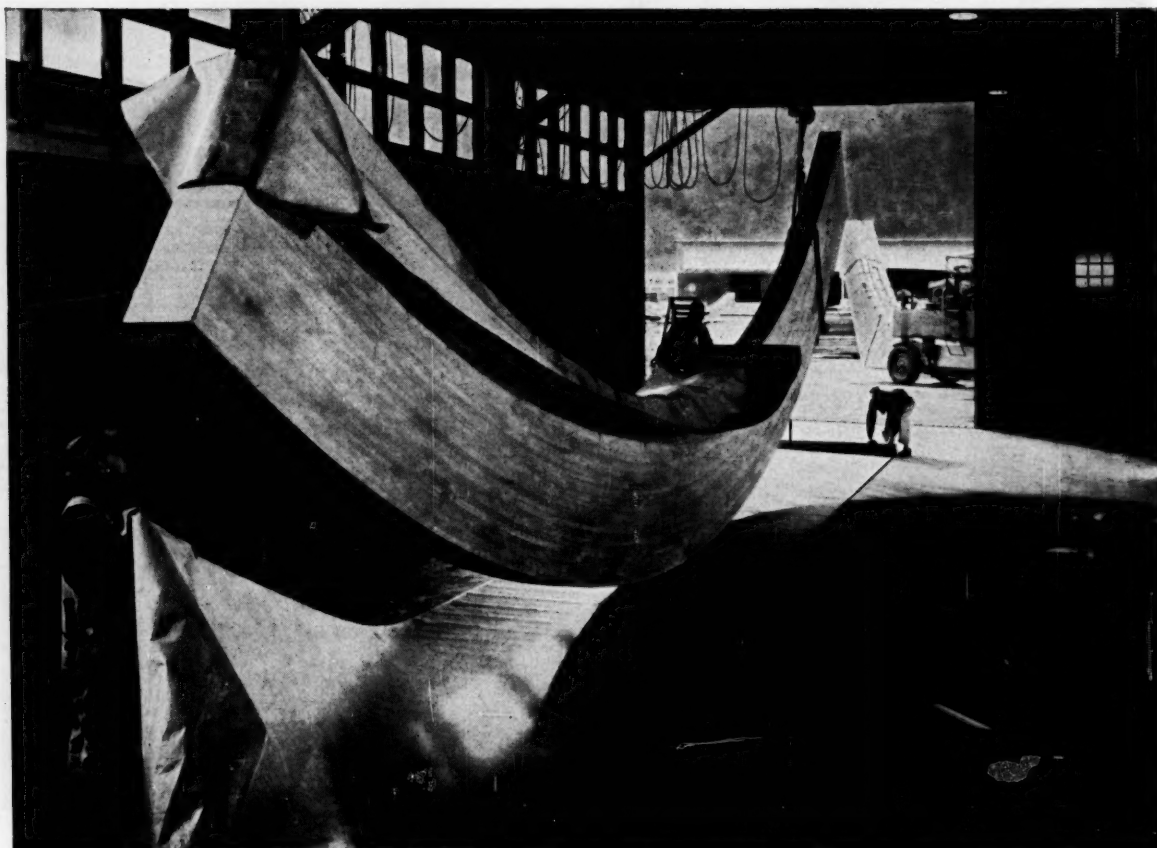


Photo courtesy American Siskraft Corporation, Attleboro, Mass., and Timber Structures, Inc., Portland, Ore.

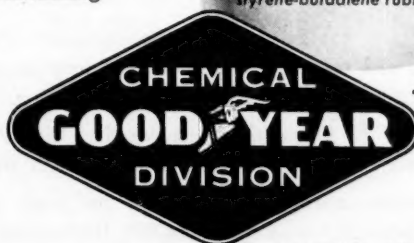
Here's a paper that's really on the beam

Wrapping a hefty, wooden, structural arch to protect its natural beauty during shipment calls for a truly heavy-duty paper. It must not only be strong, but must withstand the abrasion, abuse, weather and dirt encountered in open transport.

Right on the beam in answering these needs is the special, reinforced, laminated paper being used above. It's unusually strong, highly resistant to tearing or puncturing — and waterproof; yet extremely pliable and surprisingly low in cost.

What makes this paper so tough and durable is its high-tensile, steellike fiber reinforcement—and its special, laminating adhesive, permanently plasticized with PLIOLITE LATEX. PLIOLITE LATEX is used because of its consistent quality, its compatibility with the resins in the adhesive, its excellent adhesion, its lasting flexibility, its moisture resistance and its nonstaining qualities.

Laminating adhesives are just one of many applications for PLIOLITE LATEX. This water-dispersed rubber is continually finding new uses in the paper industry in the form of other types of adhesives plus coatings, sizes and inks. For details, including the latest *Tech Book Bulletins* on PLIOLITE LATEX, just write to: Goodyear, Chemical Division, Dept. L-9417, Akron 16, Ohio.

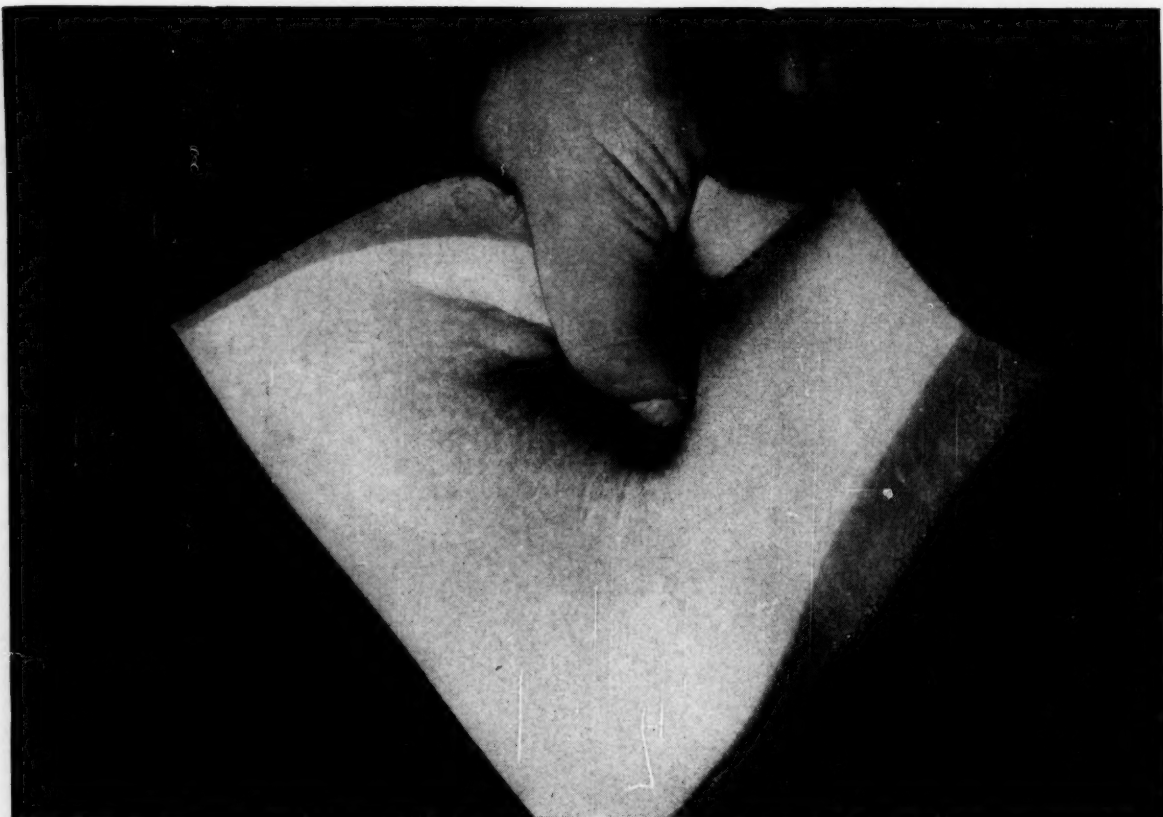


COATINGS DEPARTMENT

Chemigum, Plioflex, Pliolite, Plio-Tuf, Pliovic — T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

CHEMIGUM • PLIOFLEX • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS

High Polymer Resins, Rubbers, Latexes and Related Chemicals for the Process Industries



Good compression—is one advantage of polyether-based polyurethane foams made from new NIAx Diol PPG 2025. In addition, it helps give foams that are lower in cost than other types of flexible foams.

Now—Lowest cost Polyurethane Foams

from **NIAx Diol PPG 2025**

TRADE-MARK

(POLYPROPYLENE GLYCOL 2025—RESIN GRADE)

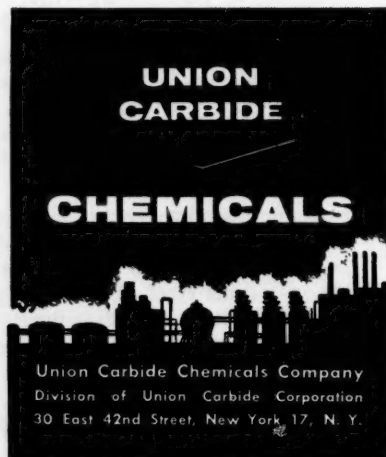
Lowest cost you say? Right! Polyether-based foams, from NIAx Diol PPG 2025 are lower in cost than other types of flexible foams. Therefore, if you are making prepolymer or foam, you'll want to take advantage of NIAx Diol PPG 2025. This new material assures uniform properties of the prepolymer or foam—from batch to batch.

In addition to imparting good compression—deflection characteristics, resilience, and recovery properties, field tests show NIAx Diol PPG 2025 gives the added advantage of excellent humid-aging.

Union Carbide Chemicals Company's NIAx Diols PPG 425, 1025, and 2025 also are bases for other types of flexible and rigid urethane foams.

For samples and specification data on these products, write Union Carbide Chemicals Company, Room 328, Department H, 30 East 42nd Street, New York 17, New York.

In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.



"Union Carbide" and "Niax" are registered trade-marks of Union Carbide Corporation.

TOP OF THE WEEK

- ▶ **Fats and oils consumption climbs to 12 billion lbs. in '57, plumped by changing pattern in end-uses**p. 57
- ▶ **Ultrafast, electronic spectrometer** now in production identifies compounds about as fast as they're formedp. 61
- ▶ **Engineers take a look at chemical engineering training** the world over at AIChE's Chicago conferencep. 65

15 OPINION

15 MEETINGS

17 BUSINESS NEWSLETTER

- 20 30% cut in lithium hydroxide price announced this week as producers seek to boost non-AEC markets.

- 21 Standard Chemical Co. is auctioned off in Troy, Ala.

- 21 Industry bridle at AEC's "limitations" on uranium buying, asks more facts for planning.

- 22 Four spokesmen give chemical industry's views on tariffs at Boggs' Congressional committee hearings.

- 22 Smith, Kline & French sets up transatlantic conference on cancer chemotherapy.

25 WASHINGTON NEWSLETTER

29 ADMINISTRATION

How do you choose your public relations approach when you're in a legal hassle? Check the merit of these three plans.

36 PRODUCTION

Across the nation, process plants are decorated in the spirit of Christmas.

41 TARGET

A glue to replace nails in construction of pallets.

45 TECHNOLOGY NEWSLETTER

48 SPECIALTIES

Industry survey, first look at new specialties, draw 700 to last week's CSMA meeting in Florida.

53 MARKET NEWSLETTER

57 MARKETS

Fats and oils consumption will top 12 billion lbs. this year. Here's how shift in use pattern has brought about the new mark.

61 RESEARCH

Bendix puts high-speed time-of-flight spectrometer into commercial production.

65 ENGINEERING

Reports on new processes and equipment developed abroad pull chemical engineers to AIChE meeting in Chicago.

Watch CW Grow — 39,386 copies of this issue printed

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948), founder, Executive, Editorial, Circulation and Advertising offices; McGraw-Hill Building, 330 West 42nd St., New York 36, N. Y. Publication office: 1309 Noble St., Philadelphia 23, Pa. See instructions at right regarding subscriptions or change of address. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice-President; L. Keith Goodrich, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; A. B. Venezian, Vice-President and Circulation Coordinator.

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STANDARD OIL COMPANY
Indiana

FLAME-PROOF WITH **BROMINE**

For plastics, textiles, fluids, protective coatings, paper and wood products . . .

five new brominated fire-proofing compounds.

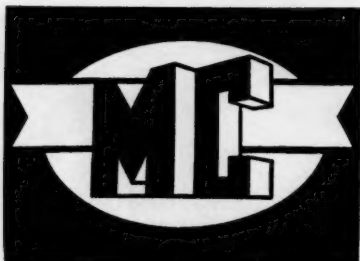
BROMINATED COMPOUNDS — molecule for molecule — are several times more efficient than their chlorine analogs for flame-proofing.

This superiority is fundamental rather than one of degree and it is why these new brominated compounds of Michigan Chemical Corporation excel as flame-proofers . . . why their use may increase the fire resistance of your plastics, textiles, fluids, protective coatings, paper and wood products.

The flame-proofing advantages of these new

Michigan Chemical compounds permit the use of smaller quantities of the flame-proofing additive than would be required with chlorine compounds. As a result, there will be less disturbance of the physical properties and appearance of the end product, and less adverse effect on product utility.

Michigan Chemical can furnish immediately testing quantities of these new profit-producing flame-proofers. Your telephone call, wire, or letterhead request for samples or further data will receive prompt attention.



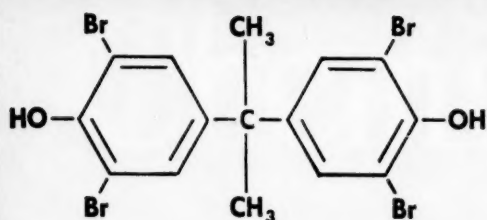
MICHIGAN CHEMICAL CORPORATION

574 North Bankson Street, Saint Louis, Michigan

EASTERN SALES OFFICE: 230 Park Avenue, New York 17, New York

Reg. U.S. Pat. Off.

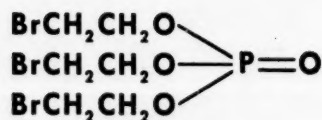
Investigate the fire-proofing potentials of these brominated compounds



TETRABROMOBISPHENOL-A - Bromine content: 58.8%. This compound supplies flame-proofing in applications where bisphenol A is already used.

APPLICATIONS:

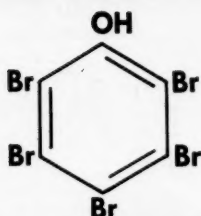
- As a flame-proofing stabilizer and anti-oxidant in polyvinyl resins.
- In the manufacture of flame-proof epoxy adhesives with superior bonding properties.
- To reduce flammability in polyurethane, styrene, and epoxy foams.
- Can be reacted with dibasic acids to produce flame-proof polyester resins.
- To impart even higher thermal stability to polycarbonate resins.



TRIS(2-BROMOETHYL) PHOSPHATE - Bromine content: 57.2%. The presence of the well-known flame-retardant phosphorus atom coupled with the bromine atom provides superior flame-proofing properties.

APPLICATIONS:

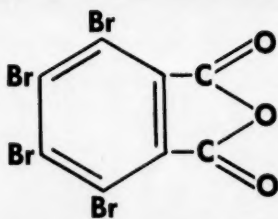
- To flame-proof textiles such as rayon and cotton.
- To flame-proof hydraulic fluids.
- As a flame-proofing additive and viscosity stabilizer in motor oils.
- As a plasticizer and flame-proofer in formulating polyester, vinyl, acrylic, cellulosic, urea formaldehyde, and polyurethane resins.



PENTABROMOPHENOL - Bromine content: 81.7%. This compound of high bromine content can be useful where flame-proofing, anti-termite and anti-fungal properties are desired.

APPLICATIONS:

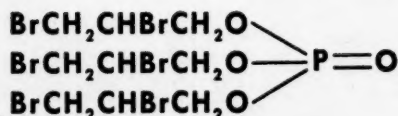
- To flame-proof wall board, piers, telephone poles and other structural wood forms.
- As the flame-proofing agent in phenolic resins.
- Presents promise in anti-fouling paints for marine applications.
- As a mildew preventative in resins.



TETRABROMOPHTHALIC ANHYDRIDE - Bromine content: 68.9%. A flame-proofing compound for use in phthalate resins.

APPLICATIONS:

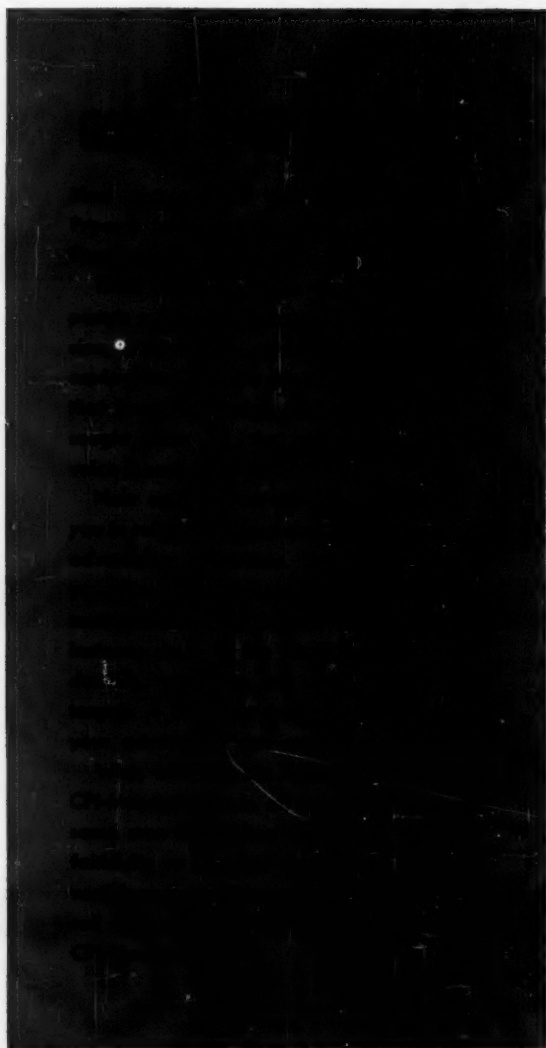
- As a flame-proofer in the manufacture of polyamide resins for electrical insulation.
- Can be reacted with polyhydric alcohols to impart flame-proof properties in the manufacture of alkyd resins for protective coatings.
- As a curing agent in the manufacture of epoxy resins.
- In the manufacture of novel phthalein dyes.



TRIS(2,3-DIBROMOPROPYL) PHOSPHATE - Bromine content: 68.7%. Another superior flame-proofing agent containing both bromine and phosphorus.

APPLICATIONS:

- To flame-proof cotton and rayon.
- Outstanding flame-proofing properties may be produced in cutting oils.
- As a flame-proofing additive in spray-coating lacquers for paper and wood products.



Chemical Week

FUNCTIONS... ADMINISTRATION & PURCHASING,
RESEARCH & DEVELOPMENT



no matter what you're selling
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one dominant voice at every
buying step. And to hit this fast-
moving audience...

your big gun is CHEMICAL WEEK,
the market in motion—succinct,
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materials, services...

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men say they read CW than any
other CPI publication... Be sure.

*CHEMICAL PROCESS INDUSTRIES

PROBLEMS AND SOLUTIONS IN LACQUER TECHNOLOGY...

one of a series of ads designed to acquaint formulators with the properties and applications of the various types of cellulose acetate butyrate.

Which type of cellulose acetate butyrate would you select for this coating problem?

PROBLEM:

To formulate a lacquer resistant
to dry-cleaning fluids

ANALYSIS: Because of the many chemical agents present in a dry-cleaning plant, this lacquer, first, must be capable of withstanding the attack of dry-cleaning solvents such as perchloroethylene and aliphatic hydrocarbons. Second, it must exhibit good moisture resistance. Third, it must

have a satisfactory degree of hardness, flexibility, toughness and stability to ultraviolet light. And, last, for ease of formulation, the type of cellulose acetate butyrate selected must be compatible with a wide variety of plasticizers and other modifying agents.

SOLUTION: Of the four types of Eastman cellulose acetate butyrate used as film formers, those of lower butyryl content, EAB 171 (17%) and EAB 272 (27%), generally have better chemical resistance than do those of higher butyryl content, EAB 381 (38%) and EAB 500 (50%). Although EAB 171 has the maximum resistance to solvents, EAB 272 is resistant to solvents usually encountered in the dry-cleaning industry. This consideration focuses our choice between these two types, because, while EAB 381 and EAB 500 have greater moisture resistance than do EAB 171 and EAB 272, their advantage in this respect is not sufficient to be of importance here.

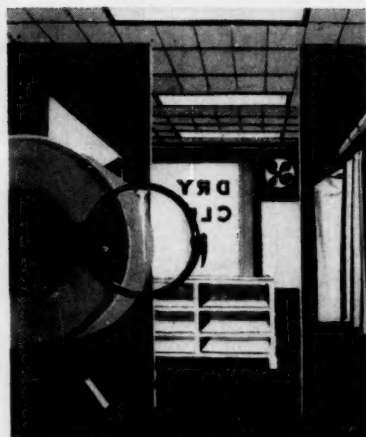
By selecting EAB 272, greater compatibility is obtained with a larger number of plasticizers and resins. This permits the lacquer formulator to select the modifying agents that will further improve the moisture resistance and other properties of films

based on EAB 272, without compromising their chemical resistance.

In addition, EAB 272 is more soluble in common lacquer solvents than is EAB 171.

EAB 272, in common with all cellulose acetate butyrates, offers yet other advantages. In the lacquer maker's plant and in the final coating, the low flammability of cellulose acetate butyrate reduces fire hazards. Lacquers based on these esters exhibit outstanding color stability and resistance to weathering.

All Eastman cellulose acetate butyrates are available in at least two viscosity ranges. They are shipped as a fine dry powder in 50-pound multi-wall paper bags. These esters dissolve readily to give clear, water-white solutions, are convenient to handle and are non-hazardous in storage. Advice on a specific formulation problem is available from your Eastman representative. We welcome your inquiry.



Authoritative, detailed information on the various types of cellulose acetate butyrate, including their chemical composition, physical properties and their use as film formers in metal lacquers, wood finishes, and textile and paper coatings is contained in Eastman's new 72-page booklet, "Cellulose Acetate Butyrate for Protective Coatings." It is a comprehensive, complete source file of fundamental information, reporting the results of years of work in formulating, testing and evaluating coatings based on cellulose acetate butyrate. Make sure a copy is always at hand by writing to the address below for yours.

Eastman CHEMICAL PRODUCTS, INC.

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SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Massachusetts; Cincinnati; Cleveland; Chicago; St. Louis; Houston. **West Coast:** Wilson Meyer Co., San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.



New lotion helps put on the "squeeze" against poison ivy

Glycerine does two important jobs in a new toxicodendron fighter. It's a carrier-lubricant for the active ingredients, zirconium oxide and Pyribenzamine. The liquid spreads smoothly over the skin, giving "all-over" protection prior to exposure, or treatment after exposure.

Glycerine also serves as a humectant, keeping the film flexible on the skin, and adding to the shelf life of the squeeze-bottle product* now available at your drugstore.

In the pharmaceutical field, new formulations still being developed—like long-established U.S.P. remedies—rely on Glycerine. Glycerine is a dispersant, a blender, a plasticizer, a stabilizer . . . serving in preparations as varied as burn oint-

ments, vitamin compounds, anesthetics and vaccines and allergen extracts.

Glycerine's usefulness continues to grow. Stable in price, dependable in supply, Glycerine offers processors a unique balance of properties: it is hygroscopic, nontoxic, stable, nonvolatile, with excellent solvent power and agreeable taste. New applications for Glycerine keep extending its use in foods, pharmaceuticals, packaging, paints and many other fields. For a handy 20-page booklet, "Glycerine Properties and Uses," write to:

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TOMORROW'S PRODUCTS TODAY... THROUGH ENJAY PETROCHEMICALS



Basic raw materials for VINYLs that wipe clean as new in seconds!

One of the most popular features of the new cars is their easy-to-clean vinyl upholstery. More and more, manufacturers of the plasticizers used in hundreds of new vinyl products are depending upon Enjay Isooctyl and Decyl Alcohols to assure superior results in formulation.

If you need technical help in the application or use of any Enjay petrochemical, you can get experienced guidance from Enjay. The modern, well-equipped Enjay Laboratories have recently been expanded and are at your service. Call or write for more information.

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OPINION

Hail Columbium!

TO THE EDITOR: It is gratifying to note in the Oct. 26 issue . . . that you have used the term columbium instead of niobium to describe work being done at the Westinghouse Research Laboratories.

You will find attached a copy of a rare memoir describing the discovery of columbium by Hatchett in 1801. The information given in this publication leads us to believe that the name for this element should be retained as columbium and should not be changed to niobium.

RUSSELL FRANKS
Manager
Marketing Research Division
Electro Metallurgical Co.
New York

Hatchett's delightful account starts out, "In the course of the last summer, when I was examining and arranging some minerals in the British Museum, I observed a small specimen of a dark-coloured heavy substance, which attracted my attention . . ." He goes on to say that the specimen was sent to Sir Hans Sloane by "Mr. Winthrop, of Massachusetts" (sic).

Therefore, the American name, columbium, is more fitting, in the opinion of many, than niobium.—Ed.

MEETINGS

American Management Assn., special conference on how to plan products that sell, Roosevelt Hotel, New York, Jan. 13-15.

Compressed Gas Assn., 45th annual meeting, Waldorf-Astoria, New York, Jan. 20-21.

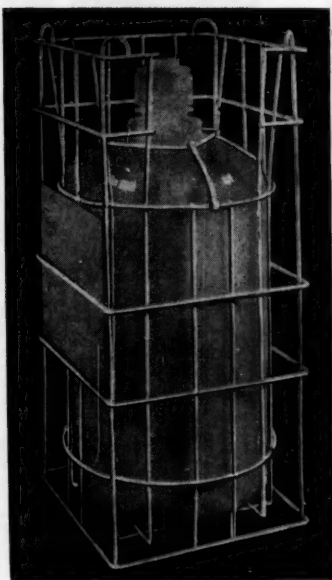
Plant Maintenance and Engineering Show, International Amphitheatre, Chicago, Jan. 27-30.

Society of Plastics Engineers, meeting on Progress through Plastics Engineering, Sheraton-Cadillac Hotel, Detroit, Jan. 28-31.

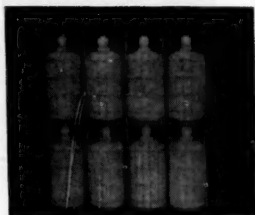
Instrument Society of America, National Chemical & Petroleum Instrumentation conference, Hotel Du Pont, Wilmington, Feb. 3-4.

Reinforced Plastics Division of Society of Plastics Industry, 13th annual technical and management conference, Edgewater Beach Hotel, Chicago, Feb. 4-6.

Chemical Market Research Assn., joint meeting with National Assn. of Purchasing Agents, subject: economic projections, Sheraton-Park Hotel, Washington, Feb. 6.



Used with unbreakable, puncture resistant Polyethylene bottle—light weight a feature



DESIGN — Sides of carrier extend well above the top of bottle protecting bottle necks. This extension of sides also provides a base for secure stacking. Wide mouth bottle permits fast filling and easy pouring without gurgle or splash. The bottle is locked in firmly because of a collar designed to fit around shoulder of bottle.

CONSTRUCTION-DURABILITY — "STEEL-X" Carriers are of welded steel construction with new epoxyphenolic coating. This type construction makes possible hand holds which simplify the work of handlers.

A shock absorbing carrier for long time service.

LIGHTWEIGHT — The thirteen gallon "STEEL-X" weighs 60% less than the old style glass carboys in wooden crates. This light weight means savings on freight.

TIME & SPACE SAVING — You save employees time because this light, easy to stack, one man package can be moved four at a time on an ordinary hand truck.

You save on floor space because you can stack 65% to 100% more "STEEL-X" Carriers in available space — and you can stack them 2-3-4 high.

COST SAVING — You save on maintenance because there are no nails to rust out, no decay of a wooden jacket — you eliminate a carboy repair department.

You save on breakage because of a puncture resistant POLYETHYLENE bottle used with the carrier. You cut costs all along the line.

• We will gladly answer all questions and provide Chemical Distributors with complete details upon request.

• Users of chemicals should write us direct if their Chemical Supplier does not as yet use this carrier.

FILM LOANED FOR DEMONSTRATION—Ask to borrow our 16 mm film which runs for 8 minutes and fully demonstrates the many benefits that can be yours.

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Containers and chemicals for Industry and Laboratory

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BENCH-SCALE DISTILLATION EQUIPMENT. The Center has various types and sizes of apparatus to distill any size sample from one cc to a tank-car load.

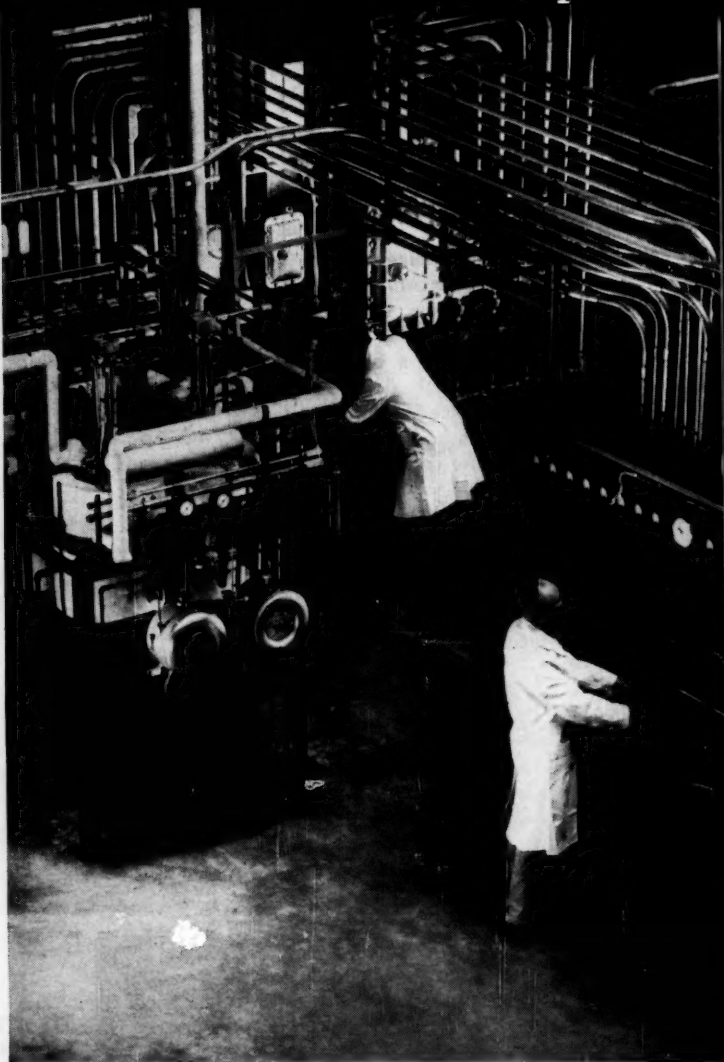
Unique Lummus Engineering Development Center—30 Minutes From Manhattan—Proves Out Processes Before Construction

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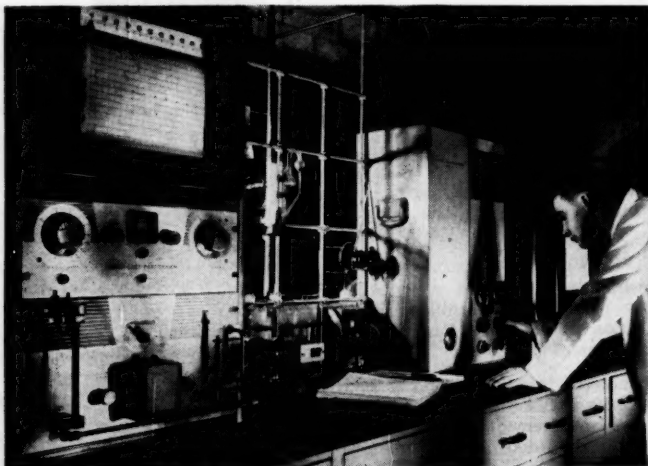
For a complete description of The Center and how it can help you bridge the gap between laboratory research and successful production, write for the 16-page brochure "Lummus Engineering Development Center." Address The Lummus Company, 385 Madison Avenue, New York 17, New York.



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MOST PILOT UNITS at The Center are put together from standard "building blocks." Skid-mounted charging units such as the one at left hold tanks, heaters and pumps for transfer and metering. Process equipment, here shown in background center, can be widely varied. At right is electrical control cabinet. All switches, relays and controls not housed in explosion-proof boxes are enclosed in cabinets like this one, pressurized with outside air to exclude process vapors.



ANALYSIS OF MATERIALS processed and produced in pilot operations at The Center is an important part of the work carried out by Lummus engineers. Here a laboratory technician determines the composition of a multiple-component gas, using a gas chromatography technique.

Business Newsletter

CHEMICAL WEEK

December 21, 1957

In the face of mounting pessimism about the economic outlook for at least the first half of '58, the chemical industry keeps coming up with cheerier notes:

Cash dividend payments are running well above last year's figures. During November—a light month for dividends—chemical companies paid out \$24.1 million, compared with \$21.8 million in the same month last year. This brought the chemical industry's 11-month total to \$693.6 million, 5.6% more than in the same period in '56. By comparison, total cash dividend payments in all U. S. industries through the first 11 months of this year represented a 3.6% rise over payments in that period in '56.

Sales are holding up strong. Pennsalt Chemicals is expecting its '57 sales total to be close to \$80 million, a more-than-10% jump over the '56 level. And Harshaw Chemical's report for the fiscal year ending last Sept. 30 shows that sales during the final quarter were slightly higher than had been anticipated a couple of months ago (*CW*, Oct. 26, p. 29), making a company record of almost \$66 million for the year—a \$1.65-million increase.

On earnings, the cheer is more subdued. Harshaw's net was just \$9,000 more than in '56, and Pennsalt spokesman W. Cooper Willits—assistant to the president—says it's obvious that his company's net will be lower than in '56.

As to the future, Harshaw hesitates to predict anything beyond "a good return" for the current quarter. Pennsalt's outlook may be gauged by Willits' remark that the company's \$55-million expansion program originally slated to be completed in '60 "probably will extend into '61 and '62."

But expansion is by no means at a standstill. Having received clearance from the Securities & Exchange Commission, Columbia Gas System is forming a new subsidiary—Columbia Hydrocarbon Corp.—to build and operate a natural gas fractionation plant at Siloam, Ky. The \$5.7-million venture—including a 6-in., 35-mile pipeline to bring in raw material from another Columbia subsidiary's \$8-million extraction plant under construction at Kenova, W. Va.—will give Columbia an "advantageous" market for the natural gasoline, butane and propane in its natural gas, will eliminate uneconomic use of valuable natural resources, and obtain for Columbia's investors a return on the economic value of their Kentucky-West Virginia natural gas.

And Union Carbide is going ahead with its building program. Carbide has awarded a contract for constructing a chemicals customer service laboratory, a basic research laboratory for Union Carbide Research

Business Newsletter

(Continued)

Institute, and a four-story office building near Tarrytown, N. Y. Meanwhile, Carbide's Linde Co. Division is negotiating for a 30-40-acre plant site between Antioch and Pittsburg, Calif., and is planning to build a new plant at Savannah, Ga., replacing an older oxygen and acetylene facility that's to be offered for sale.

Down in Texas, American Petrofina Co. is going ahead with a \$2.8-million expansion and improvement project at its Mount Pleasant refinery. Included: Platformer and alkylation unit, increased storage capacity, laboratory expansion, and gasoline-vapor recovery system.

Abroad, three big new projects involve companies with U. S. connections:

- Monsanto Chemical Co. expects to cosponsor with Carbo-metal S. A. I. C.—a leading Argentine producer of calcium carbide and ferroalloys—a plant to make vinyl chloride and Monsanto's Opalon-brand polyvinyl chloride at Mendoza, Argentine.

- The Glidden Co. is supplying the process, plant design and other technical assistance for a \$6.5-million titanium dioxide plant to be built by Industrias Quimicas Basicas de Mexico, S. A., in Veracruz.

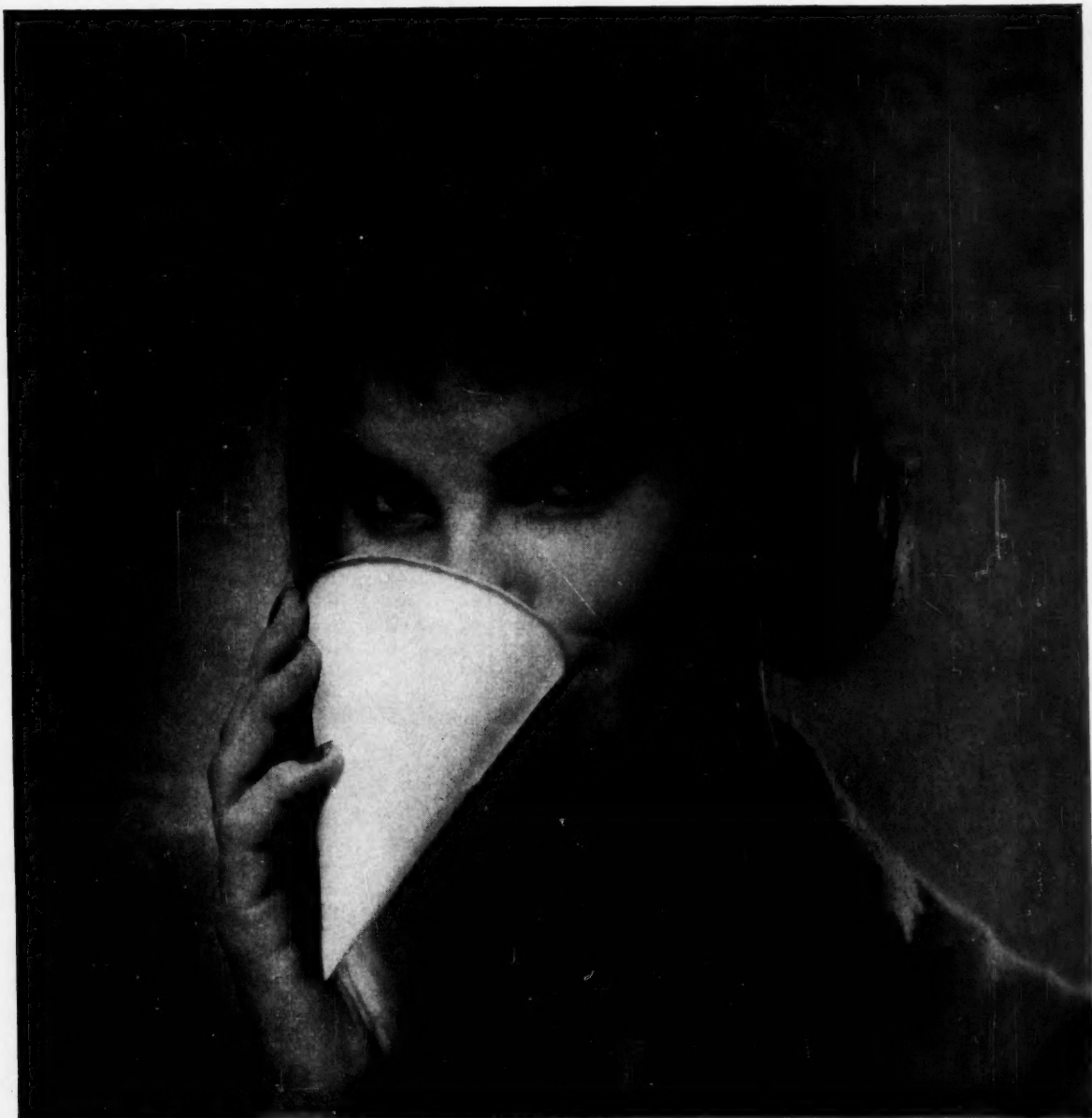
- A \$2.2-million Udex unit—designed by Universal Oil Products Co.—is being built by Shell Oil at its Stanlow refinery (Cheshire, Eng.) for production of an aviation gasoline blending component.

Latest straw-in-the-wind on technical manpower supply and demand:

An engineers' union is accusing a large employer of taking advantage of "recent uneasiness about possible layoffs" and "the current surplus of engineers" to cut down on annual merit salary increases. The Seattle Professional Engineering Employees Assn. charges that Boeing is being "completely opportunistic" in allotting only about 1/2 of 1% of its engineering payroll—instead of the "usual" 2%—for merit increases.

And whether the available supply of technical manpower is being properly utilized is the subject of a series of 14 local "utilization conferences" starting with a two-day meeting this week at the University of Missouri (Columbia, Mo.). Over-all sponsor: Technical Manpower Utilization Task Force of the President's Committee on Scientists and Engineers.

No chemical process concern has been worrying about a surplus of technical manpower, but Olin Mathieson is striving to do something with a surplus of by-product that's piling up near the company's fertilizer plant at Pasadena, Tex., at the rate of 1,000 tons/day. The material: powdered gypsum, containing slight impurities that keep out of the wallboard market. While Olin Mathieson seeks an outlet, the stockpile—tying up a 30-acre tract—is coming to be known as "the highest point in east Texas."



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The remarkable optical properties of TITANOX white pigments are most aptly illustrated by their use in paper. To increase brightness and opacity of wax papers . . . to increase legibility in printing papers by reducing show-through . . . to eliminate dull backgrounds in packaging stocks . . . or simply to give a bright new look to paper cups—TITANOX is your first choice in titanium dioxide white pigments.

In fact, TITANOX is the number one choice for *anything* that needs white pigments—paints, rubber and plastics, or ceramics. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices in principal cities.

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Lithium Prices' Long Slide

Over Three Years, a Near-50% Reduction

(Prices per pound of lithium hydroxide monohydrate, carload lots)

Dec. '54	97½¢
Apr. '55	90¢
Nov. '55	80¢
Jan. '57	78¢
Mar. '57	75¢
Dec. '57	55¢

Surfeits Spur Lithium Price Slash

This country's four big producers of lithium chemicals last week made one of the biggest commodity price cuts of the year—a 27% slash in the price of lithium hydroxide.

Led by American Potash & Chemical Corp., the U.S. producers dropped their contract price on this item by 20¢/lb. The new rates: 55¢/lb. in carload lots, 56¢ for less-than-carload

quantities of lithium hydroxide.

The cuts stem from specialized Atomic Energy Commission needs for lithium-6, an isotope occurring in the natural state with much greater quan-

ties of lithium-7. AEC buys the hydroxide, takes out lithium-6, then sells the still-valuable tailings back to the producers for resale to others. Because the government is using ever-increasing quantities of lithium-6 for secret military projects, the tailings have been piling up fast. The drastic price cuts are intended to move them.

Basic Price Stands: Prices to AEC are stabilized by long-term contracts. The Foote Mineral and Lithium Corp. of America contracts run through 1959 while the AP&CC pact, signed later than the others, reportedly runs well into 1960. The one other major lithium producer, Maywood Chemical Works (Maywood, N. J.), doesn't have a contract, though it does sell "substantial quantities" to the government.

The lower resale prices aren't expected to cause any cutbacks. All four producers tell *CW* they'll keep turning out the hydroxide at present rates. And while some loss of income may result from lower prices, the companies don't expect it to be severe. Reason for this is that most of the business is with AEC. As things stand now, say officials of all four firms, there's no indication that AEC's needs are going to fall off.

New Producer Coming: Despite the buyers' market and falling prices in the lithium industry, Quebec Lithium Corp. (Montreal) is going ahead with plans to build a \$3-million lithium processing plant at Rouses Point, N. Y. (*CW*, Dec. 7, p. 35). Quebec Lithium's president, Pierre Beauchemin, tells *CW* the company is researching a low-cost process, will delay construction until next spring. His firm is a substantial supplier of lithium ore concentrate for Lithium Corp. Its contract has another four years to go. When Quebec's new plant is completed, Beauchemin says, he may seek a contract with AEC.

Meanwhile, the lower prices may spur more widespread use of lithium.

American Potash Vice President W. J. F. "Buck" Francis says he's expecting more use of lithium in grease compounds. He believes it may well become a standard component of regular car lubes. Socony Mobil Oil Co. reportedly is trying out lithium greases at some service stations and expects its use to grow.

For Alloys, Enamels: Francis looks for metallic lithium to win acceptance in light, strong, heat-resistant alloys

with light metals, such as aluminum and magnesium. American Lithium Institute is sponsoring research at various colleges on use of lithium in such products as glass, ceramics and enamel frits.

Some makers of ceramic coatings have said they've been waiting for lithium prices to drop. Lithium lowers the melting point of vitreous enamels, making it possible to coat aluminum as well as steel. Its competitor in this field is lead; but lead's toxic properties have made producers wary.

Surplus Capacity: On the other hand, these non-government uses—though increasing—are still relatively small. With the lithium industry at only three-fifths of capacity, they fall far short of taking up the slack. Latest production figure for both military and civilian uses is 32 million lbs./year, against reported capacity of 50 million lbs./year.

The overcapacity is largely the result of AEC's urgent call for lithium several years ago. In the case of Lithium Corp. and American Potash, the AEC granted government-guaranteed loans to finance new lithium plants. Foote received no loan, but was awarded contracts for all it could produce from expanded facilities. The companies apparently over-estimated future AEC needs. But no one denies that lithium for defense may well reach new production highs in the next few years.

It does appear, though, that there'll be little room for any more lithium producers—at least, any who plan to sell only to the industrial market. No one knows what will happen to military needs; but judging from the companies' readiness to drop prices and the top three producers' stated intentions of renegotiating similar AEC contracts, the lithium industry will stay safely in the black.

Industry Plea for Data

Prospects of more candor about the requirements of uranium's No. 1 customer—the U.S. Atomic Energy Commission—brightened this week following the recent parley between producers and an AEC spokesman.

The meeting, in Albuquerque, N.M., gave producers a chance to air their grievances about the dearth of information for planning purposes. It also led to a promise by Sen. Clinton

Anderson (D., N. M.) to seek release of pertinent data now bottled up under security regulations. Anderson is vice-chairman of the Congressional Joint Committee on Atomic Energy.

To a skeptical audience of more than 150 uranium industry men asking clarification of AEC's plans for contract buying, Jesse Johnson—raw-materials director for the agency—explained that there'll be no cutback on ore buying, but that there will be a "limiting of expansion" at government-sponsored mills.

"If you aren't cutting back," one small producer demanded, "why is it we're having trouble selling ore?" Another said his company closed its mine because there wasn't any market at all for its ore. Several accused AEC of withholding from trusted suppliers useful facts already known by the Russians.

Gen. Patrick Hurley, president of Uranium Institute of America, called for "drastic reform" of AEC policy so the domestic industry could be told about present and future requirements, including foreign procurement.

Under present conditions, Vitro Corp.'s President William Hall told *CW*, processing of ore will continue at a "substantial" rate, but exploration will be drastically curtailed. Johnson said present limitations should be viewed as a short-range situation. Over the long haul, he told the producers, there'll "probably be a need for expansion."

Going, Going – Cheap

A soft market for used plants in the South's mixed-fertilizer industry was demonstrated last week in an unusual public auction at Troy, Ala.

Standard Chemical Co.—established 74 years ago and probably the oldest fertilizer concern in the state—was sold to two of its major stockholders, Mr. and Mrs. Louis Head. Their winning bid for the property, which grossed about \$2 million/year when operating at capacity several years ago, was \$124,745. Included in the sale: a 20,000-tons/year fertilizer plant, a small sulfuric acid unit, an office building and several small sheds.

Head—a banker, insurance dealer, and long-time resident of Troy—told *CW* the firm will be operated as a partnership and will be back in production before year's end.

Industry Split on Tariffs

A sharp split within the chemical industry enlivened the closing day of a hearing on tariffs and foreign trade late Friday in Washington. There, a House Ways & Means Subcommittee is setting the stage for the coming battle over renewal of the reciprocal trade act.

The industry's majority view—favoring three-year extension of that act with continued safeguards against injury to domestic producers—was presented by spokesmen for Manufacturing Chemists' Assn. and Synthetic Organic Chemical Manufacturers Assn., representing more than 90% of the industry's productive capacity.

Dissent came from President Thomas Cabot of Godfrey L. Cabot Co., Inc., and from President T. G. Hughes of Oronite Chemical Co., a subsidiary of Standard Oil Co. (Calif.). Their concerns—which have production and distribution facilities in many nations—favor the more liberal trade and tariff program advocated by the Eisenhower Administration (*CW Business Newsletter*, Dec. 14).

Nonneutral Chairman: Taking a prominent part in the discussion was Rep. Hale Boggs (D., La.), chairman

of the foreign trade policy subcommittee and a leading proponent of freer trade. Boggs sought to show that the U.S. chemical industry should favor freer trade because of its stake in world export markets. He warned that domestic industry would have to "take the lead and make some sacrifices" to protect a trade system that strengthens the world against communism.

Also, Boggs cited figures to show that most of this country's chemical imports come from Canada and that more than 50% of Canada's chemical industry is owned by U.S. investors. He asked whether U.S. companies aren't actually competing against themselves in this respect.

MCA spokesman Richard Hansen of Allied Chemical & Dye Corp. countered Boggs' statement on exports with a prediction that U.S. chemical exports will "drop substantially in the next two years." Hansen and SOCMA's P.K. Lawrence of Du Pont also argued that a good part of U.S. chemical exports are accounted for by one commodity—fertilizers—and also by foreign aid programs.

Thumbs Down on OTC: Both MCA

and SOCMA went on record in favor of continuation of the reciprocal trade program, but with protection for domestic producers. They turned thumbs down on the Administration's proposal for U.S. participation in the Organization for Trade Cooperation, which would administer trade agreements negotiated under the General Agreement on Tariffs and Trade.

Of the two organizations, SOCMA took the stronger stand for safeguarding domestic industry. Lawrence told the subcommittee that the tariff law's escape clause and national security provision—under which special tariffs or import quotas could be established—should be strengthened. Both Lawrence and Hansen stressed the need for protecting the jobs of U.S. scientists, Lawrence adding that "We have more Ph.D. per unit of output than any other industry."

All four witnesses agreed on the complexity and diversified nature of the chemical industry, and all favored some protection for certain segments. They also were in accord on the need for a better classification of the some 12,000 chemical items produced in the U.S.—a total that has been increasing at the rate of 400/year—with duties set selectively on a product-by-product basis.



One Firm's Contribution: Transocean Science Panels

The second "voices across the sea" medical science conference was arranged recently—via the new transatlantic cable—by Smith, Kline & French (Philadelphia). The 75-minute discussion by U.S. (left) and British panels of noted physicians con-

cerned "Advances in the Chemotherapy of Cancer." It was heard over amplifier systems by physicians meeting in Philadelphia, London, and Bethesda, Md. Cosponsoring organizations: American Medical Assn. and Britain's Royal Society of Medicine.

COMPANIES

Vitro Corp. has formed a new subsidiary to handle all its overseas operations. Called Vitro International, the new division will be headquartered in Geneva, Switzerland. It will handle all the company's foreign sales, licensing, engineering and manufacturing operations. President of the new subsidiary is Norman Spector, former vice-president of Vitro's engineering division.

Minnesota Mining & Mfg. Co. will offer for public sale up to 115,000 shares of its common stock. Now held by the estate of John C. Dwan, a former company director, the shares will be sold early in January through a group of underwriters headed by Goldman, Sachs & Co.; Kidder, Peabody & Co.; and Piper, Jaffray & Hopwood. Total market value: about \$9 million.

Cosden Petroleum's 7,000-bbbl./day refinery at Hawley, Tex., will go on a stand-by basis Jan. 1. It's expected to be shut down through most of '58 while a study is made on the feasibility of converting it to make special products, probably petrochemicals. A 50% cut in the company's military aviation gas contract prompted the move.

Imperial Paper & Color Corp. (Canada) Ltd. (St. Johns, Que.) will buy the dry-color manufacturing facilities of Sherwin-Williams Co. of Canada Ltd. for an undisclosed price. The acquisition reportedly won't affect Sherwin-Williams' pigment color operations in the U.S.

Phillips-Foscue Corp., a newly organized firm capitalized with 400,000 shares of authorized stock, will build a new 5-million-lbs./year polyether foam plant in High Point, N. C. Construction will begin immediately, is scheduled for mid-'58 completion. Output will go to furniture makers in the area.

EXPANSION

Uranium: The Atomic Energy Commission has approved plans for a 500-tons/day uranium mill to be built by Fremont Minerals Corp. at Riverton, Wyo. Plant size was scaled down from the 750-tons/day unit originally proposed.

Lime: National Carbide, division of Air Reduction Co., will add a \$2-million unit to its plant near Louisville, Ky., to reclaim waste lime sludge from its calcium carbide-making process. The sludge has been piling up at the rate of several hundred tons/day on a 70-acre tract adjacent to the plant. The new unit will remove water by heating and centrifuge techniques so the lime may be reused.

Polyethylene: Eastman Kodak Co. will double the capacity of its polyethylene plant in Longview, Tex. Plans call for the unit to be turning out 85 million lbs./year of medium- and low-density polyethylene by late '58. It will be the third expansion since the plant began operating in Oct. '54 with a capacity of 20 million lbs./year.

Sulfur: Freeport Sulphur Co. has purchased 50.4 acres in Grand Isle, La., for a shore base to augment its sulfur mining operations in the Gulf of Mexico. The land was bought from Grand Isle Industries Inc.

FOREIGN

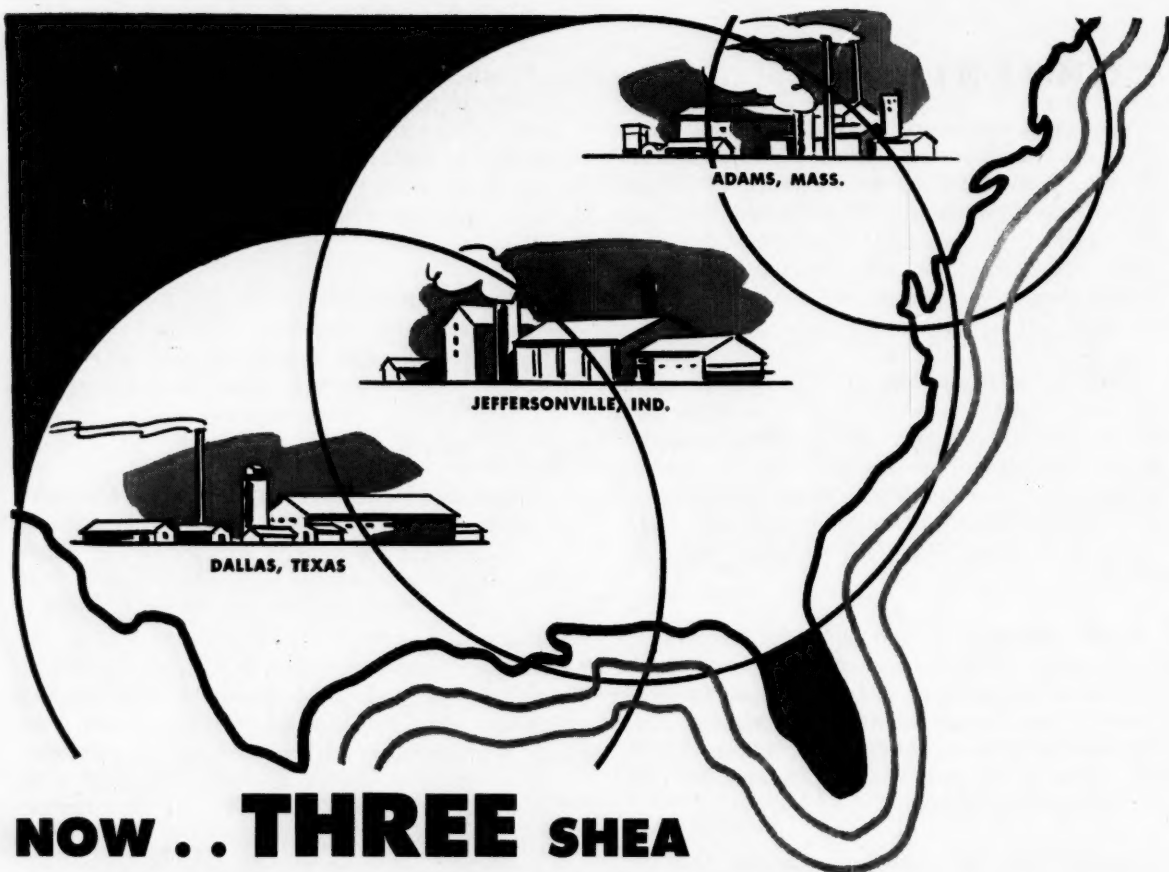
Chemicals/Poland: Poland's Ministry for Chemistry is aiming at an over-all 16% rise in chemical output for '57 over the '56 total. A number of new plants are expected to contribute to a similar gain in '58. In Gorzow, a new polyamide fiber plant has started production of a nylon-type fiber called Steelon. At Oswiecim (formerly the German city of Auschwitz), a polyvinyl chloride plant has come onstream and a styrene plant is under construction. A new soda plant is in production at Janikowo, and the phosphate fertilizer plant at Stettin has been expanded. The Rokita plant in Brzeg Dolny will soon start turning out cyclohexanol. A new nitrogenous fertilizers plant at Kedzierzyn and a caprolactam plant in Tarnow are due onstream this month.

Paper/Colombia: W. R. Grace & Co. plans a \$13-million paper plant at Yumbo in Colombia's Cauca Valley, with yearly production of 18,500 tons of bond paper. This plant—to be operated by Pulpa y Papeles Colombianos S.A., a new Grace subsidiary—will use locally produced sugar cane fibers and chemicals.

Pharmaceuticals/Mexico: McNeil Laboratories (Philadelphia) has purchased Gerbermex S.A. (Mexico City) for production and distribution of McNeil's pharmaceutical specialties in Mexico. The new subsidiary's name is to be changed to McNeil de Mexico S.A.

Chemicals/China: Communist China has been increasing its purchases of chemical products from other nations. During the first 10 months of this year, British exports of chemicals to China were valued at \$6.4 million, compared with \$2.5 million for the same period in '56. Value of Chinese chemicals imported by Britain—mainly rosin—dipped slightly to \$3.6 million.

And China has sent to Tokyo a six-member fertilizer mission to negotiate the purchase of made-in-Japan chemical fertilizers. The mission was invited by the Japan Ammonium Sulphate Assn. and five other fertilizer organizations.



NOW .. THREE SHEA SODIUM PHOSPHATE PLANTS for better service to more customers

Sodium Tripolyphosphate
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Trisodium Phosphate
Sodium Hexametaphosphate
Phosphoric Acids, Food
and N. F. Grades
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The finest sodium phosphates in the world aren't worth much—unless you can get them *when you want them*. Shea's new multiple production program—with plants in Adams, Mass., Jeffersonville, Ind., and Dallas, Tex.—assure prompt delivery of Shea's top quality sodium phosphates.

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Washington Newsletter

CHEMICAL WEEK
December 21, 1957

Major disclosures on controlled thermonuclear reactions may be forthcoming from the government any day now.

Useable power from thermonuclear reactions is a few years away at most, not decades. British, U. S., and Canadian scientists are all informed of the progress each is making—so, you can discount implications that, for instance, the British are ahead of the U. S.

Actually, the three countries are working so closely the projects are almost a single project. The British may have laboratory equipment to produce a momentary fusion reaction, but U. S. sources hint guardedly but confidently of several approaches being pursued in U. S. laboratories that are as far along. And there is no doubt that we have many more scientists, much more money and equipment at work.

AEC Chairman Lewis Strauss is blocking public discussion of the progress that's being made. His interpretation of the security clauses in the atomic law is stricter than that of the British. But there is no thought of disclosing enough information to help the Russians; just enough to silence Strauss' British critics.

Crisis over U. S. program for developing nuclear power is coming to a head. Both AEC and the Joint Congressional Committee on Atomic Energy have held exhaustive, private meetings with public utilities and equipment makers. Object: to accelerate development.

Democrats want Strauss to get together with them to work out a program. It has become clear, they contend, that the utilities by themselves aren't going to finance the experimentation and development needed to keep U. S. technology in this field abreast of developments in the Soviet Union and other foreign countries.

Budget for fiscal '59 goes to the printer in the next few days. Congress gets the budget early next month. On paper, the budget will show a balance. Proposed spending figures for the year beginning next July 1 will be a shade under revenue figures. But most experts agree that this balanced paper budget will be bent into something different as it goes through Congress during the next 6 months.

Spending will be higher on new "catch-up-with-the-Russians" programs. Cuts in welfare spending—belt-tightening—won't be as much as Eisenhower wants and the government's income will be less than expected.

Democrats in Congress are preparing strong proposals and positions of their own—and they're determined to push hard where Eisenhower's own program isn't "urgent" enough to suit them. In general, "lack of urgency" is the sharpest criticism Democrats have to make.

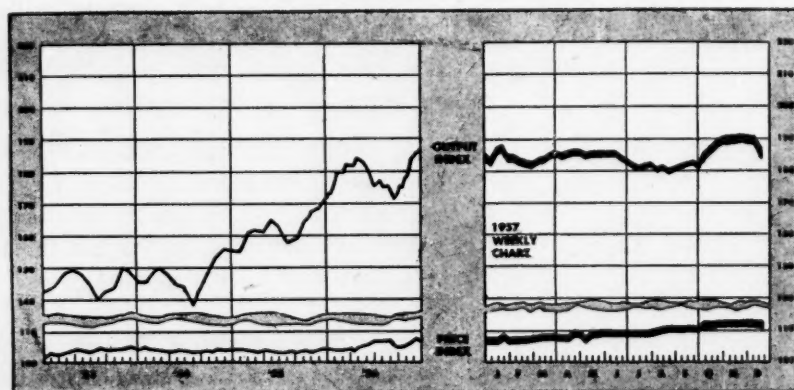
Washington Newsletter

(Continued)

With Eisenhower in charge of the G.O.P. program, Democrats will be less free-wheeling in their opposition. But they're no longer afraid to oppose him. The revelation of Russian advances and U. S. lags in science and technology, they feel, has made it possible—finally—to take potshots at Eisenhower and his policies without fear of political reprisals from their constituents. Eisenhower's phenomenal political prestige, they feel, has at long last worn thin.

Grants to cities for pollution control would be turned back to the states under the first recommendations produced by a committee of state and federal officials. The committee was created by President Eisenhower some months ago to find ways of handing federal programs—and compensating tax revenues—over to the states. Similarly, grants to cities for urban renewal planning, for rebuilding public buildings damaged by disasters, etc., would be given to the states. Revenue to pay for these programs—if they are transferred to states—would come from the tax (now federal) on local phone calls, worth about \$150 million per year.

But the fact is that such proposals are likely to have hard sledding in Congress next year. Reason: opposition from those cities that figure they'd lose out in the federal-to-state transfer.



Business Indicators

WEEKLY

	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100).....	187.5	185.0	186.5
Chemical Week wholesale price index (1947=100)...	111.2	111.1	107.6
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	40.05	40.84	43.26

MONTHLY

Trade (million dollars)
All manufacturing
Chemicals and allied products
Petroleum and coal products

Manufacturers' Sales			Manufacturers' Inventories		
Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
28,000	28,200	28,700	54,100	54,200	51,800
2,008	1,951	1,979	3,718	3,741	3,558
2,880	2,803	2,727	3,616	3,597	3,204

U.S.I. CHEMICAL NEWS

December 21 ★

A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

★ 1957

U.S.I. Among Winners of Chemical Engineering Achievement Award

The 1957 Award for Chemical Engineering Achievement, presented at *Chemical Engineering's* Annual Award Dinner at the Waldorf-Astoria in New York on Tuesday, December 3, is a group award recognizing the pioneering application of chemical engineering principles and processes in extractive metallurgy.



U.S.I. is one of 75 organizations in industry and government to share this honor, and is cited for its contribution to zirconium and titanium process technology. The U.S.I. processes for these metals are based on sodium reduction of the metallic tetrachlorides and are believed to be the most economical processes developed to date for the production of metal sponges.

The citations of the Committee of 90 senior educators, under the chairmanship of Dr. Walter Whitman of M.I.T., are limited to the newer metals: uranium, plutonium, zirconium and hafnium, tantalum and niobium, lithium, boron, beryllium, thorium and the rare earth metals. Also included as important to the nuclear industry are aluminum, nickel and titanium.

New Process to Synthesize DL-Piperitone Depends On Sodium Dispersions

DL-Piperitone can now be synthesized from ethyl acetoacetate, a by-product of neoprene manufacture. As against natural piperitone, a synthetic material has the advantage of dependable supply. Consequently an efficient and inexpensive method of commercial production has been sought for some time.

The technique of dispersing metallic sodium in inert hydrocarbon media, developed and perfected over the past several years by U.S.I., is at last providing a practical solution to the problem. A proposed commercial process based on this technique follows:

(1) Sodium and isooctane are agitated together to form a dispersion which is added to ethyl acetate in the mole ratio of 7.3 to 1. The resulting solution is heated.

MORE

Vinyl Heat Stability Improved When ISOSEBACIC® Acid Is Used As Plasticizer Intermediate

New Plant Starting Up To Produce ISOSEBACIC Acid

A newcomer among plasticizer intermediates, ISOSEBACIC acid, is improving the heat stability of polyvinyl chloride films. The table below is based on tests conducted by a formulator of top-grade films for seat-cover use. It gives the comparison between diisooctyl isosebacate, an ester of ISOSEBACIC acid, and a commonly used plasticizer, diisodecyl adipate.

Comparing columns (1) and (2), it can be seen that heat stability improves 50%, from 30 to 45 minutes, when 15 parts of the isosebacate replace an equal quantity of adipate. A comparison of columns (3) and (4) reveals that heat stability is improved 100%, from 30 to 60 minutes, when both ester concentrations are raised to 22 parts.

Tests also indicate that ester plasticizers formulated with ISOSEBACIC acid have improved color, odor, and oil and soapy water extraction properties. These properties are important for applications such as auto seat covers, furniture upholstery covers, shower curtains, luggage and handbags.

ISOSEBACIC acid is a mixture of isomers of sebacic acid in about these proportions:

2-ethyl suberic acid72-80%
2,5-diethyl adipic acid12-18%
sebacic acid6-10%

In addition to the vinyl plasticizer application, the material is being evaluated in polyurethane foams, polyamides, polyesters, alkyd resins and jet lubricants.

ISOSEBACIC acid is a product of U.S.I. research. It is derived from butadiene and sodium, both available in unlimited supply. U.S.I. is now in the process of starting up its new ISOSEBACIC plant at Tuscola, Ill.

Diborane Now Produced Commercially; 3 Amine Boranes Being Researched

Diborane, precursor of pentaborane rocket fuel and promising as an intermediate, reducing agent, catalyst and flame speed accelerator, is being marketed in commercial quantities.

According to the manufacturer, physical and chemical properties are now completely determined. Chemical reactions which have been thoroughly investigated include those with ammonia, amines, phosphines, ethers, carbonyl compounds, hydrocarbons, metal alkyls and hydrides, and sodium.

Amine Boranes in Research Quantity

Also available, although in research quantities only, are dimethylamine-borane, trimethylamine-borane and pyridine-borane. Their utilization as selective reducing agents in non-aqueous solvents has been of most interest. They are polymerization catalysts and inhibitors for acrylates and vinyl compounds. In addition, applications as antioxidants and stabilizing agents have been suggested as promising possibilities.

Table of Field Test Data Comparing Diisooctyl Isebacate Against DIDA as a Vinyl Plasticizer Intermediate

FORMULATION	Parts Per Hundred of Resin			
	1	2	3	4
PVC	100	100	100	100
DIOP (diisooctyl phthalate)	18	18	22	22
DIDA (diisodecyl adipate)	15	—	22	—
Diisooctyl isebacate	—	15	—	22
Phosphate plasticizer	11	11	—	—
Stabilizer A	2	2	2	2
Stabilizer B	1	1	1	1
Stabilizer C	1	1	1	1
1. Volatility (active carbon method) 24 hrs. at 158 F, % loss	1.38	1.21	0.92	1.07
2. Clash-Berg, Tf, °C	-24.4	-20.0	-23.9	-23.4
3. Heat Stability, minutes stable at 350° F	30	45	30	60
4. S.P.I. Impact Test (Masland) Pass/Fail ° F	-20/-25	-20/-25	-20/-30	-25/-30
Gauge	0.019"	0.020"	0.019"	0.021"
5. Germicidal Lamp Test, 16 hrs, tack	slight	slight	slight	slight
6. Blooming, Room Temperature, press polished	O.K.	O.K.	O.K.	O.K.

December 21 ★

U.S.I. CHEMICAL NEWS

★ 1957

CONTINUED

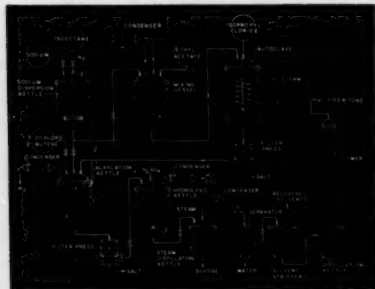
DL-Piperitone

(2) When reaction is complete, isopropyl chloride is added and the mixture is heated.

(3) The resultant slurry is filtered and the filtrate is alkylated with dispersed sodium to form the sodium enolate of ethyl oxoisopropyl acetoacetate.

(4) 1,3-dichloro-2-butene in anhydrous benzene is added, and the mixture is refluxed until neutral.

(5) After filtration, the mixture is hydrolyzed with sulfuric acid, distilled and stripped of solvents. A crude, high-boiling dl-piperitone results. Further distillation yields pure dl-piperitone.



With this process, synthesis of DL-piperitone is reported to be commercially feasible.

New Standard Issued on Polyethylene Plastic Pipe

A new Commercial standard for black flexible polyethylene plastic pipe has been established by the Dep't. of Commerce, in cooperation with the Society of the Plastics Industry and the Nat'l. Sanitation Foundation.

The new standard, CS 197-57, specifies that "...the pipe shall be manufactured of virgin polyethylene, that no scrap material has been used, and that it is satisfactory for potable water." It also lists new dimensional tolerances and testing procedures.

Copies are available from Superintendent of Documents, U. S. Government Printing Office, Washington 5, D. C. for 10¢ a copy.

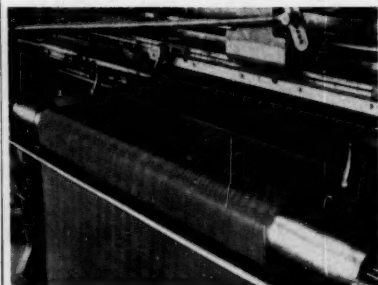
Corrosion-Resistant Mesh Is Now Produced with Improved Titanium Wire

The fabrication of titanium wire cloth now has reached a production basis. This is due primarily to improvements in quality of wire, which until recently lacked the needed uniformity and elongation, and had a tendency to work-harden rapidly and gall on metal-to-metal contact.

With wire-forming problems licked, and cloth being fabricated efficiently with high-purity and ductile grades of mill product, new applications are developing rapidly. Although noted for its high strength-to-weight ratio the biggest advantage of titanium in wire cloth form is its unique corrosion resistance. The metal has a corrosion rate of only .00001 inches per year in sea water, and is not subject to stress corrosion cracking in sea water or sea air.

Titanium wire cloth is being fabricated more and more into filter screens, catalyst screens or similar assemblies, where it handles mineral acid solutions, sodium hypochlorite, chlorides of all kinds, organic acids, alkalis and other reagents, with superior resistance to corrosion.

Several companies also report ability to make woven screen from zirconium wire, for those applications where zirconium corrosion resistance is superior to titanium.



Titanium wire cloth being woven (photo courtesy Cambridge Wire Cloth Company).

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U. S. I.

A silicone rubber which vulcanizes at room temperature has just been introduced for encapsulating, potting, sealing and caulking. Retention of rubber-like properties from -70 to 500°F is claimed. **No. 1301**

"The Rudiments of Feed Formulation", a 6 page reprint reviewing the industrial sources of animal feed constituents, the formulation of mixed feeds and the energy and nutrient values found therein, is now obtainable on request. **No. 1302**

A new monomeric ester-type plasticizer for vinyls and cellulose is described in a 4-page data sheet now available. Chemically it is di-2-ethylhexyl isobsebacate, reported about 1/3 lower in cost than the corresponding sebacate. **No. 1303**

Entirely new series of high molecular weight disazo red pigments for PVC and latex paints is said to combine the strength and brightness of organic pigments with the stability normally associated with inorganic pigments. **No. 1304**

Thioglycolic acid—its properties, reactions and uses—is described in a new 20-page catalog now available free of charge. An extensive bibliography of relevant patents and trade paper articles is included. **No. 1305**

Ethyleneurea (2-imidazolidinone), a new chemical, is now on the market. Used to make lacquers, varnishes, finishing agents, adhesives, plasticizers. Forms highly polymerizable vinyl and other derivatives. **No. 1306**

New series of zinc rich coatings to protect steel from the atmosphere and in marine and chemical use has been developed. Applied by brush or spray. Are said to be tougher, tighter, better bonded than old-type zinc coats. **No. 1307**

New adhesive for polyurethane foams is made with new, extremely fast-drying polymer, is said to lose its depression tack faster than any other material on market. Permits bonding with an adhesive as soft as the foam itself. **No. 1308**

A gas analyzer for measuring trace hydrogen, oxygen and nitrogen in metals has just been introduced for use right in the mill. Claimed to be only apparatus on market for both vacuum fusion and extraction. **No. 1309**

Pyridine N-oxide can now be obtained in commercial quantities. This exceptionally reactive derivative can be used to prepare many other pyridine chemicals valuable to the drug, dyestuff and allied industries. **No. 1310**

PRODUCTS OF U.S.I.

CHEMICALS FOR PLASTICS

ISOSEBACIC® Acid: mixture of isomers of C₁₀ aliphatic dibasic acids.

PETROTHENE® Polyethylene Resins.

Butanol (Normal Butyl Alcohol): solvent for resins.

ANSOL® M: anhydrous denatured alcohol, special blend for resins.

ANSOL® PR: anhydrous denatured alcohol, special blend with higher ester content.

Normal Butyl Acetate: medium boiling solvent for nitrocellulose.

Ethyl Acetate, 95-98%: solvent for cellulose derivatives.

Ethyl Ether, Technical: solvent for resins.

Acetone (Dimethyl Ketone): solvent for vinyl resins, cellulose acetate.

OTHER PRODUCTS:

Alcohols: Ethyl (pure and all denatured formulas), Normal Butyl, Amyl, Fusel Oil; Proprietary Denatured Alcohol Solvents SOLOX®, FILMEX®, ANSOL® M, ANSOL® PR.

Esters, Ethers and Ketones: Normal Butyl Acetate, Dibutyl Phthalate, Diethyl Carbonate, Diethyl Oxalate, Ethyl Acetate, Ethyl Ether, Acetone, Diethylol.

Intermediates and Fine Chemicals: Acetoacetylaldehydes, Dimethyl Hydrazine, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Chloride, Ethyl Sodium Oxalacetate, U.S.I. ISOSEBACIC® Acid, Methyl Hydrazine, Sodium Ethylate Solution, Triethyl Aluminum, Trimethyl Aluminum, Urethan USP (Ethyl Carbamate).

Animal Feed Products: Calcium Pantothenate, Choline Chloride Products, MOREA® Premix, Special Liquid Curbay®, DL-Methionine, Niacin USP, Riboflavin Concentrates, Vitamin B₁₂ and Antibiotic Feed Supplements, Vacatone® 40, Vitamin D₃ and K₂ Products, Antioxidant (BHT) Products, Special Mixes, U.S.I. Permadry Products (Sealed-In Vitamin A).

Inorganic Chemicals: Ammonia, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide, Sulfuric Acid.

Metals: Titanium Sponge, Zirconium Sponge, Zirconium Platelets, Hafnium Oxide, Hafnium Sponge.



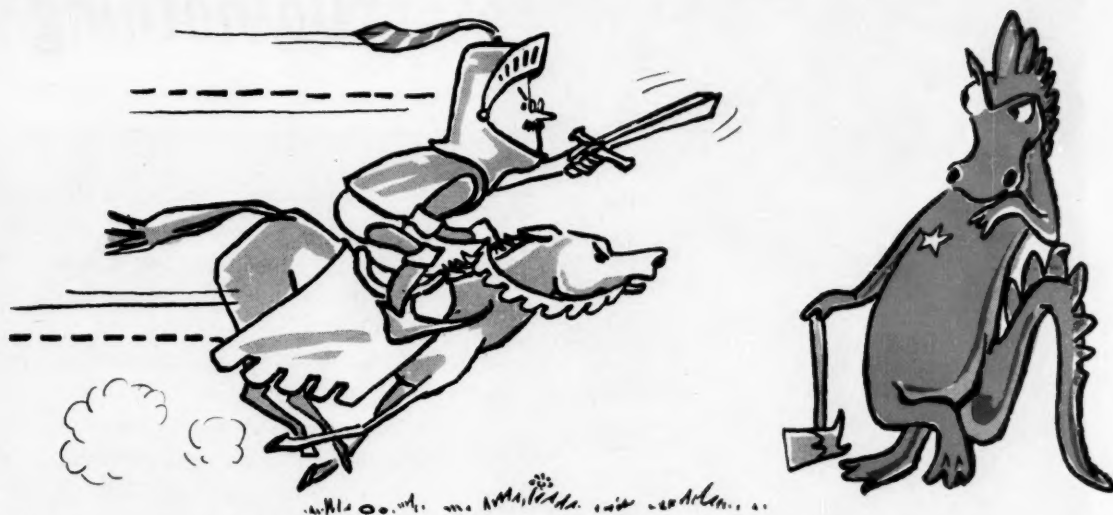
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ADMINISTRATION



1—A firm can mobilize a hard-hitting PR campaign to counter the bad publicity of an antitrust suit.



2—Some firms give a routine denial.

3—A 'no comment' is best in some cases.

Three Ways to Fight Bad Antitrust Publicity

Signs indicate that 1958 will be another big year for chemical industry mergers, and government antitrust actions are sure to keep pace. To combat unfavorable publicity arising from such actions, firms will use a variety of public relations approaches, according to a *CW* survey this week.

Three major types of PR campaigns are used by chemical and process companies. These are: (1) the firm approach, characterized by frequent messages to the public; (2) middle-of-the-road, typified by an occasional notice; (3) passive,

characterized by no public comment and information to the directors and employees only. Each type of campaign has its place in presenting a company's viewpoint to the public, tacticians agree, and a single firm over a period of time may use all three.

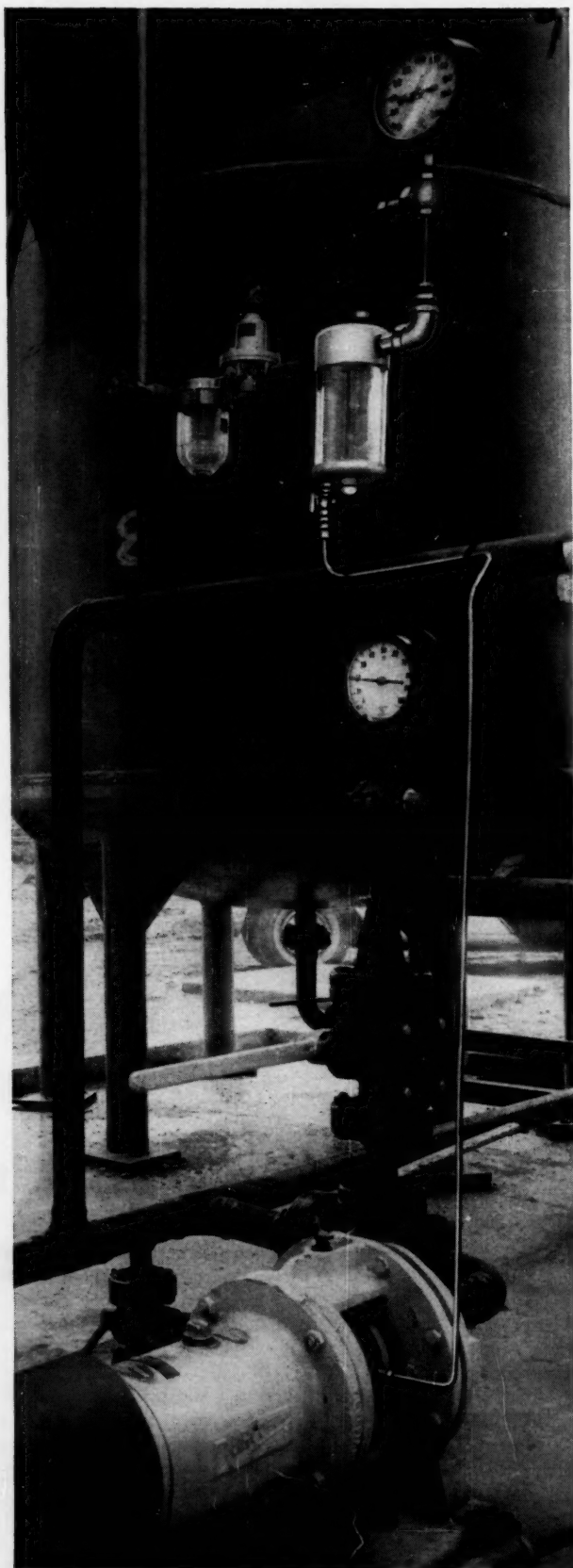
The Firm Approach: Procter & Gamble prefers the firm PR approach to counter unfavorable publicity.

Answering Federal Trade Commission charges that the firm's acquisition of Clorox Co. violated the Clay-

ton Act (*CW*, Oct. 19, p. 32), P & G publicly accused the FTC staff of "completely ignoring" basic factors of the American competitive system. The company has widely and continually publicized its viewpoint.

Officially, P & G feels that "any time a company is involved in litigation—regardless of the merits of the case—its reputation suffers some damage. It becomes, therefore, a matter of public relations concern."

Commenting on the basic PR program used, P & G management says, "Protection of the company's reputa-



3M Chemicals opening new worlds of use for

"Do-nothing"

Another exciting development in 3M Fluorochemistry . . . "do-nothing" chemicals that normally completely refuse to react with, dissolve in, or mix with anything. Their "do-nothingness" has opened the way to new product designs and engineering concepts in many industrial fields.

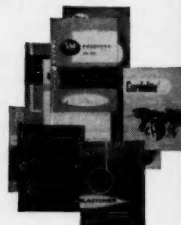
These new inert fluids—from the research labs of the Fluorochemicals Division of 3M's Chemical Products Group—already are proving their singular value as sealants, coolants and insulators.

For example, the pumping station shown at left was once a danger spot. Anhydrous hydrofluoric acid, the process fluid, would corrode the packing in the pump after a few hours of operation, with the result that the pump gave off intolerable HF fumes.

The solution: a new 3M inert fluid to replace the conventional sealant. Injected under pressure onto the packing around the pump shaft, it acted as a chemical curtain to ward off acid attack. Thus, this "do-nothing" fluid, neither affecting nor being affected by HF, virtually eliminated corrosion and costly parts replacement; cut maintenance from weekly intervals to a few hours per month.

Investigate fluorochemical inert fluids in terms of your processing problems . . . improving your product's design and performance, too

FOR FULL DATA on 3M Chemical Products, write, using your company letterhead, for free literature to Dept. WE-127, 3M Company, St. Paul 5, Minn.



Lifeline to pump injects 3M fluorochemical inert fluid into mechanical seal on pump shaft to protect packing from attack by corrosive HF. **FLUOROchemicals DIVISION**

Chemical stalemates liquid HF attack



Corrosion resistance "in the bag". Now with KEL-F® Brand tri-fluorochloroethylene film, bags can be prefabricated in almost any size to serve as liners in your steel tanks. KEL-F® membrane is formed into an impervious bag by sealing its seams by impulse, heat or electronic process. Thus, a strong, highly corrosion-resistant envelope can be custom-designed for your exact needs . . . prefabricated for faster, more efficient in-the-field installation. JERSEY CITY CHEMICAL DIVISION.



Wonder-wafer increases switch life. By using a wafer-thin insulation mount of KEL-F® Brand Plastic with high dielectric strength, the life of this miniature switch is boosted to 5 million cycles. Currents up to ten amps are handled—without shorting—even under such severe thermal cycling as -90° F. to $+200^{\circ}$ F. Despite sudden temperature rises, this halofluorocarbon plastic will neither warp, soften, nor crack. And the delicate metal parts of this precision switch are safe from corrosion. JERSEY CITY CHEMICAL DIVISION.

Rubber resists ozone attack. Fura-Tone® Brand Resins in solid and liquid forms increase effective resistance of Neoprene to ozone nearly 2,000 times . . . make a world of difference in extending its service life in such applications as insulation for high-tension cables, outboard motor or automobile radiator hose, automobile ignition wire, windshield gaskets. The addition of this remarkable anti-oxidant also improves resistance of these compounds to oil and petroleum solvents. IRVINGTON CHEMICAL DIVISION.



CHEMICAL PRODUCTS GROUP • Fluorochemicals Division • Hastings Chemical Division • Irvington Chemical Division • Jersey City Chemical Division • Color and Acid Division

MINNESOTA MINING AND MANUFACTURING COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW



Public Relations Attitudes Vary in Countering Antitrust Publicity

Company	Government charges	PR attitude
* Procter & Gamble	Clayton Act violation in acquisition of Clorox Co.	Firm: frequent releases to public; vigorous campaign.
* Parke, Davis	conspiracy to fix prices	Middle - of - road: milder campaign; fewer public releases.
* Crown Zellerbach	Clayton Act violation in acquisition of St. Helens Pulp & Paper Co.	Passive: no public releases; information to directors and employees only.
* Du Pont	Clayton Act violation in ownership of General Motors stock	Firm: frequent releases to public; vigorous campaign; continuing program

tion usually requires a clear statement of the facts of the company's side of the case to the public. It is a public relations responsibility to present these facts through the appropriate channels of communication, although there is no 'formula' that is always followed."

Middle of the Road: Parke, Davis & Co. uses a middle-of-the-road approach to public relations in antitrust cases. This approach, P-D management feels, was necessary during the firm's recent price-fixing suit, because of certain factors in the case.

First consideration was that the case was a criminal suit, to be tried before a jury. Any appearance of influencing the jury had to be avoided at all costs.

Second, P-D feels that the government had picked the company as a target more or less at random, because the practice of choosing outlets and regulating conditions of retail sale "has been long and widely practiced by all 'ethical' pharmaceutical firms. Therefore, it was the industry, not P-D on trial," P-D officials say.

In an effort to maintain good public relations, P-D sent a representative to Washington (site of the trial in U.S. district court) with orders to make himself helpful to any agencies seeking information at the trial. He was to help them understand the P-D view-

point, and to be present whenever the defendants were interviewed.

Press releases were restricted to President Harry Loynd's statement sent out at the time of the indictment, and an explanatory notice (similar to the statement) issued at the start of the trial in October.

When the court dismissed the government's criminal suit for lack of evidence (*CW*, Nov. 23, p. 48), P-D, in line with its policy, issued a simple four-sentence statement on the favorable outcome.

A Passive Campaign: Crown Zellerbach has been putting the passive approach to antitrust publicity to good use during its battle with FTC—begun this year—over the company's acquisition in 1955 of St. Helens Pulp & Paper Co. (*CW*, March 16, p. 22).

CZ doesn't put out much information for public consumption, because management feels the case doesn't warrant it.

Stockholders are kept informed through messages in the annual report, and employees learn of the company's position by reading the firm's internal information bulletin, "Management Digest," published twice a month.

One reason for the company's approach: management feels that there's hardly a company that could afford to buy St. Helens that wouldn't also run into possible antimerger trouble.

As of now, the case rests with a five-man FTC commission that is considering findings of an FTC hearing examiner and oral testimony from Crown Zellerbach. An unfavorable decision for the firm can be appealed.

Continuing Approach: Several process industry companies make an effort to present their views on antitrust principles as often as possible. One purpose of this continuing approach is to help the public better understand some of the problems of business.

Du Pont uses this approach. Pointing out that the public cannot make the right decisions if it doesn't get full information on key questions, Du Pont Vice-President Lamont du Pont Copeland says a lack of understanding "is certain to lead to public attitudes toward business and industry severe enough to put a brake on our economic, scientific, social and military progress.

"Specifically, there is good reason to doubt that the public understands as much as it should about the operation of the economic principles that underlie our social, cultural, educational, scientific and even religious structures."

Copeland feels that one of the most serious areas of misunderstanding is the question of bigness in business. The main difference between large and small companies is that "a large company has more people and more diversified talents than a small one," he said.

From this thinking has come a Du Pont public relations theme designed to show the need for bigness in business. It says in effect, "You have to fit the organization to the job to be done." In other words, as Du Pont carefully points out to TV audiences, it takes a small bridge to span a stream, but it takes a sizable structure to span a harbor.

Campaign to Fit the Case: Choice of the approach depends to a great extent on circumstances in the case. Plainly, no one technique is best in every case; nonetheless, some industry companies prefer one approach.

Almost all firms, however, seem to agree with Procter & Gamble's statement: when a company's involved in a litigation its reputation suffers. This requires a clear statement of the facts of the company's side of the case to the public, and this is a public relations responsibility.

ADMINISTRATION

LEGAL

Monsanto Injury: There's new word on that case involving Monsanto Chemical Co. in Maury County, Tenn. (*CW Business Newsletter*, Dec. 7). The company is being sued for \$300,000 by Cecil Ketchum, an employee of a Monsanto subcontractor.

Ketchum says an explosion at a kiln he was working on hurled him 15 or 20 ft. to the ground, and that bones in both feet were broken. This, he alleges, has prevented him from working since December, 1956. Monsanto contends Ketchum was not hurled off by the explosion, but fell instead. The suit has been carried over until May, 1958 and there's talk among observers that it may be settled out of court.

Hair Oil Advertising: The Federal Trade Commission has decided that false advertisements (as defined in Sect. 15 of the FTC Act) include those "which are misleading due to their failure to reveal facts material in the light of other claims made."

The opinion, by Commissioner Sigurd Anderson, accompanied an FTC order requiring that Loesch Hair Experts (Houston, Tex.), Collins Hair & Scalp Experts, Winston Ltd. and Carey Hair & Scalp Experts (all of Oklahoma City) reveal in their future advertisements that the "great majority" of all cases of thinning hair and baldness are of the so called "male pattern" type, and that the firms' preparations are of no value in cases of this sort.

The male pattern type, which accounts for 95% or more of all baldness, "is not affected by anything applied to the scalp," according to Commissioner Anderson.

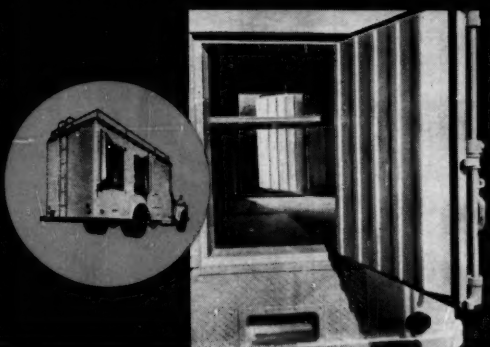
LABOR

Unfair Practices: The National Labor Relations Board has reopened a hearing into charges that Teamsters Local 118 engaged in unfair practices after failing to organize Scobell Chemical Co. at Rochester, N. Y.

NLRB contends that the local illegally influenced employees of four carting companies to boycott Scobell. The Teamsters have a so-called "hot cargo" clause in their contracts with carriers who deal with Scobell, but it has been charged that the truck drivers, not their employers, were

MIN CHEMISTRY at work

case: Dense, clean, strong, cold-stable, moisture-resistant plastic parts with ASP 400 filler



Ice cream compartment of refrigerated dairy truck body... an inside story of modern features via reinforced plastics. Body designed and built by Johnson Truck Bodies, Rice Lake, Wisconsin.

Filler Report: Customer uses high loadings of ASP 400—M & C's Aluminum Silicate Pigment filler—in formulations of epoxy and polyester resins and fiberglass to make roof tops, floors, and doors (including door panels, frames and steps) for bodies like the one shown here. Results:

1. Superb "wetout" to get a homogeneous mixture and absence of "resin pools."
2. A surface bond and seal that keeps fibers down, stops water wicking, and aids sanitation.
3. Great toughness to resist the slams, bangs, loads, scrapes, and temperature changes of a "refrigerator on wheels."
4. Non-tacking molding ease... long pot life.

Our business is to supply low-cost non-metallic mineral products that are process-engineered to make things go smoothly in your plant... well in your markets. Use the coupon.

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Send: ☐ Detailed plastic literature ☐ Free samples

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For more data, see
*Chemical Materials
Catalog*
Pages 330-334



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ACTIVATED BAUXITE (*Porocel*)
KAOLIN (*Edgar • ASPs*)
LIMESTONE (*Chemstone*)
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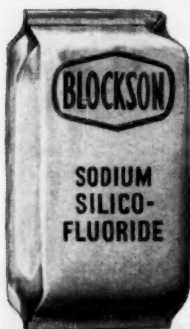
SERVICE AND STOCKS
IN 30 CITIES

**Blockson has
the stand-by
capacity to
stand by its
SODIUM
SILICO-
FLUORIDE
customers**

**with Blockson as your
SSF supplier you can**

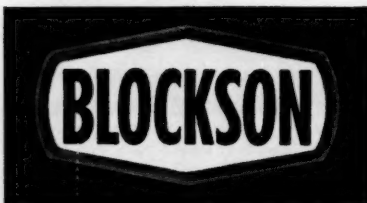
PLAN AHEAD SAFELY

The largest Sodium Silicofluoride manufacturer, Blockson has stand-by capacity PLUS a plant expansion program that builds well ahead of its customers' increasing needs.



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CALL BLOCKSON
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P.S. Include SSF with other Blockson chemicals in your mixed-car orders.



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Chemical Corporation
Joliet, Illinois

ADMINISTRATION



Teamster Delegate and English: Despite threats, no changes.

the only people notified to conduct a boycott against Scobell. Both union and Scobell have been cited for unfair practices.

No Change in Aid: As expelled officials of the giant Teamsters Union stalked from the floor of the recent AFL-CIO national convention in Atlantic City, N.J., chemical union delegates were wondering what difference expulsion would make in their strike and raiding relations with Teamster locals. Consensus: not much, if any, in spite of Teamster Secretary-Treasurer John English's explosive threat that Teamsters' enemies could go "straight to hell."

A check by *CW* of chemical union men who attended the convention shows that none are much concerned. Representatives of both unions expressed the view that where Teamsters had cooperated before they will cooperate again, and where they had raided before they will raid again. Expulsion from the federation, most felt, wouldn't materially affect relations between organizing or striking locals of the Teamsters and the chemical unions.

Right-to-Work: In Frankfort, Ky., a group of citizens representing labor, business and agriculture have incorporated a Right-to-Work Citizens Committee to seek adoption of a right-to-work law in Kentucky. Representa-

tives come from numerous communities, including such chemical process communities as Louisville, Owensboro, Ashland and Paducah.

KEY CHANGES

Ralph H. Dwan, to director, Minnesota Mining & Mfg. Co.

Bertram K. Denton, to vice-president and director, Monsanto-Kasei (Tokyo, Japan), associate of Monsanto Chemical Co.

Frederic N. Schwartz, to president; **Lee H. Bristol**, to board chairman; and **Robert B. Brown**, to executive vice-president; Bristol-Myers Co.

Marshall S. Lachner, to president, B. T. Babbitt (Albany, N. Y.).

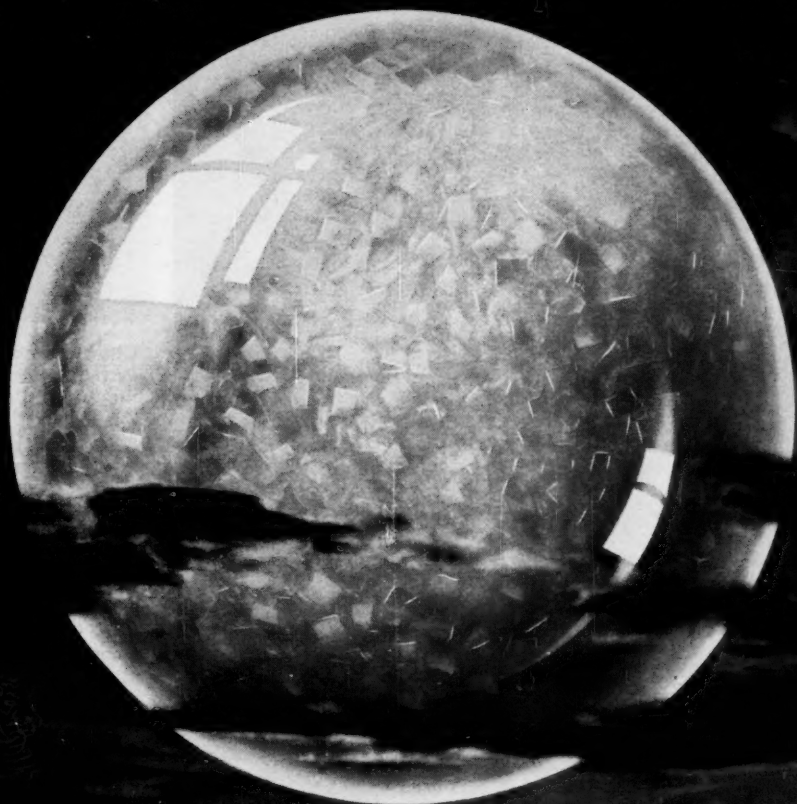
Donald G. Brower, to vice-president in charge of research, Victor Chemical Works (Chicago).

Russel L. Haden, Jr., to general manager, Chemicals Division, Virginia-Carolina Chemical Corp. (Richmond, Va.).

Norman E. Hathaway, to director and vice-president—marketing, Oronite Chemical Co. (San Francisco).

John F. Davis, to technical director, Arizona Chemical Co. (New York), jointly owned subsidiary of American Cyanamid Co. and International Paper Co.

Burton W. Schroeder, to manager, Chemical Products Division, Archer-Daniels-Midland Co.



there's a future in this crystal

TRIMETHYLOLPROPANE BECOMES A COMMERCIAL CHEMICAL THROUGH CELANESE ALDOL PRODUCTION

The properties of this free-flowing flaked polyol have always intrigued the chemist. Its ability to improve the quality of paints, protective coatings, and particularly the exciting new polyurethane foams, promised Trimethylolpropane a big role in these and other applications. But, until Celanese developed a method for high volume, low cost production, the usefulness of

Trimethylolpropane was severely limited.

New aldol processing units at the Celanese Chemcel Plant in Bishop, Texas, are now turning out commercial quantities of Trimethylolpropane —making available to manufacturers a product possessing low water content, low melting characteristics, and exceptionally high purity.

The development of Trimethylolpropane into

a commercially practical chemical is an example of how Celanese research and product development teams are finding new ways to give industry what it needs in more productive basic and intermediate materials.

Celanese Corporation of America, Chemical Division, Dept. 852-L, 180 Madison Avenue, New York 16, N. Y.

Celanese®

Basic reasons

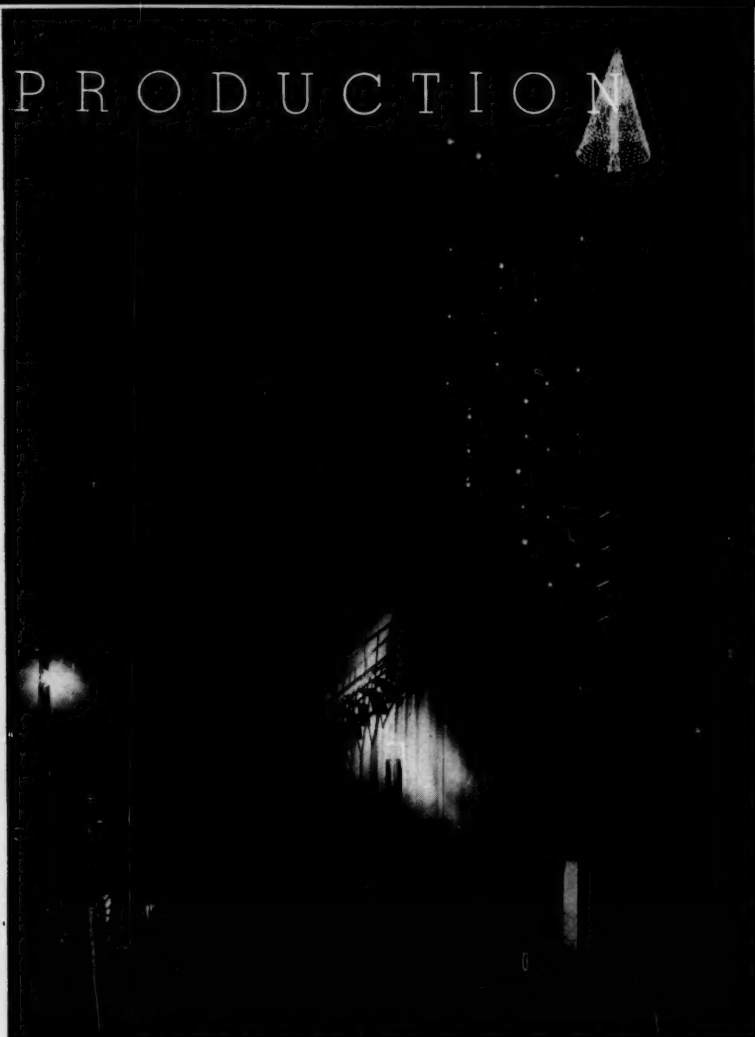
Acids	Functional Fluids	Polyols
Alcohols	Gasoline Additives	Plasticizers
Aldehydes	Glycols	Salts
Anhydrides	Ketones	Solvents
Esters	Oxides	Vinyl Monomers



..... for improved products

Agricultural, automotive, aviation, building, electrical, paper, pharmaceutical, plastics, surface coatings, textiles.

PRODUCTION



Tree of lights perched atop Sinclair cat cracker sets Christmas mood for Houston refinery's observance of yuletide festivities.



Snowless Christmas at Texas City doesn't prevent Union Carbide Chemicals Co. from decorating plant cafeteria for an open house.



Christmas greetings in huge red-co Barton Plant at Luling, La., shine out

How Plants Can

Photos on these pages show what visitors and passers-by can expect to see at many chemical process industry plants this week. The lights that are a regular part of the production pageant are dimmed by the lights of the pageant of Christmas.

Oil refineries, with their many large, outdoor process units, are among the Christmas decoration leaders. But many chemical and pharmaceutical plants are not outshone.

That passers-by appreciate what they see was brought home to Esso at its Bayway, N.J., refinery last year. Decoration



Sinclair Refining Co. turns storage to mammoth Christmas drums. Loudspeakers



ed lights at Monsanto Chemical Co.'s
cross the Mississippi River.



Snow- and light-covered trees lend Christmas fairyland atmosphere
to Ciba Pharmaceutical's plant and research center at Summit, N.J.

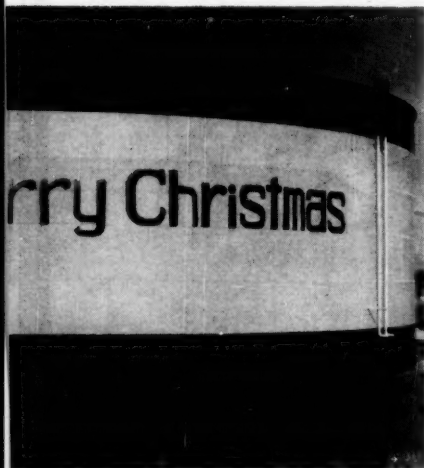
ature Yule Spirit

of a smoke stack beside the New Jersey Turnpike was discontinued. And although a cat cracker and other units some distance away from the turnpike were decorated, motorists informed Esso that the stack display was missed.

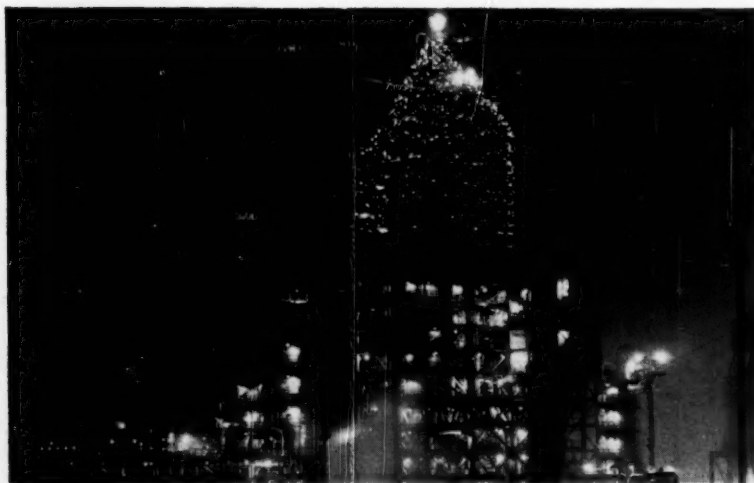
The decorations often take considerable time to put up. For example, Hoffmann-LaRoche's maintenance men spend all spare time for several days in early December arranging the display at the Nutley, N.J., plant. But firms say it is worth the effort, makes the plant a more pleasant place to work and promotes community relations.



Multicolored lights deck trees and shrubs at Hoffmann-La Roche's
Nutley, N.J., plant, from early December through Christmas season.



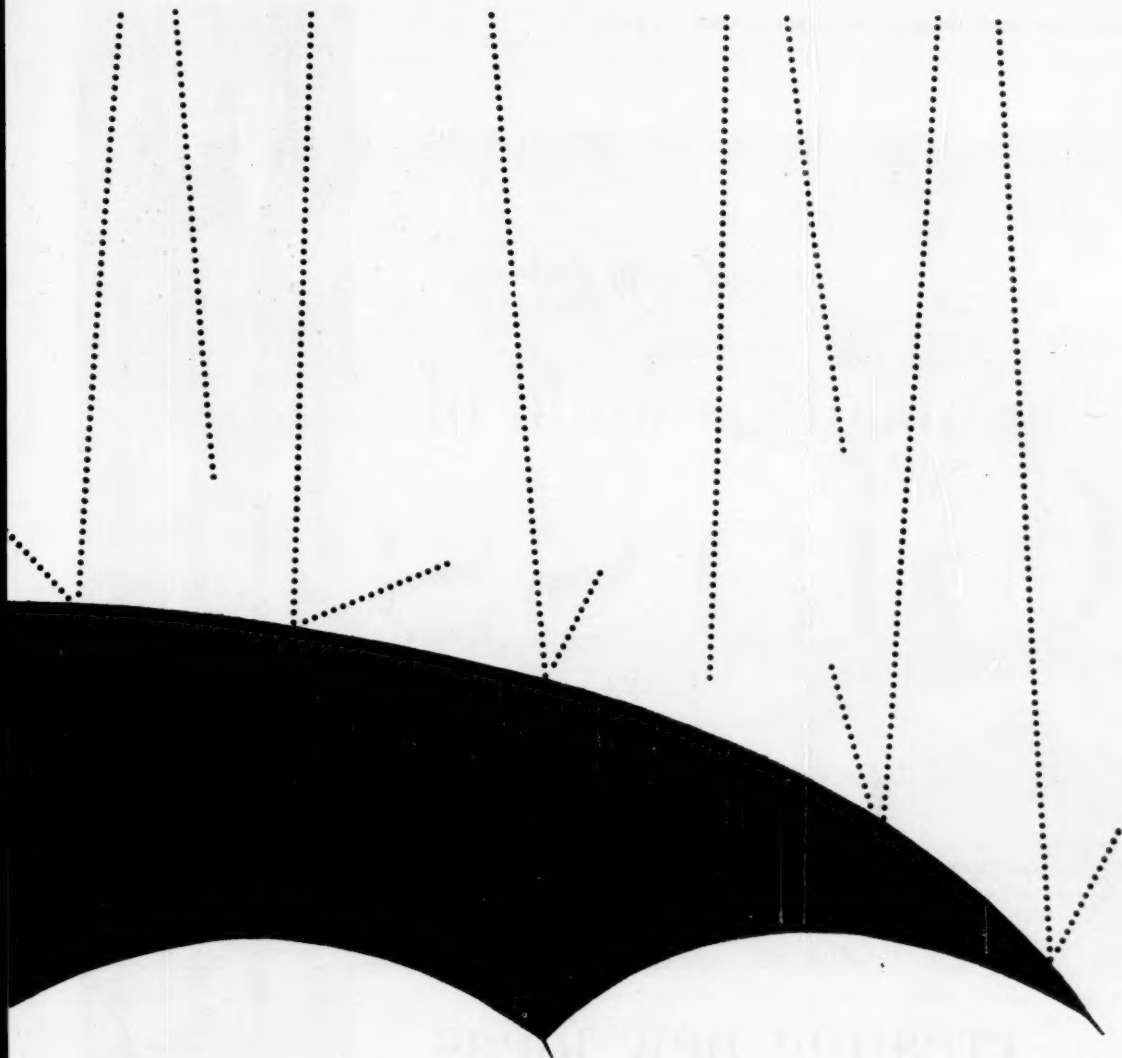
s at its Houston, Tex., refinery into
rs drift carols out over refinery.



Humble Oil & Refining Co. turns a 260-ft. cat cracker at Baytown,
Tex. refinery into a giant 1,200-light tree, a tradition since '49.



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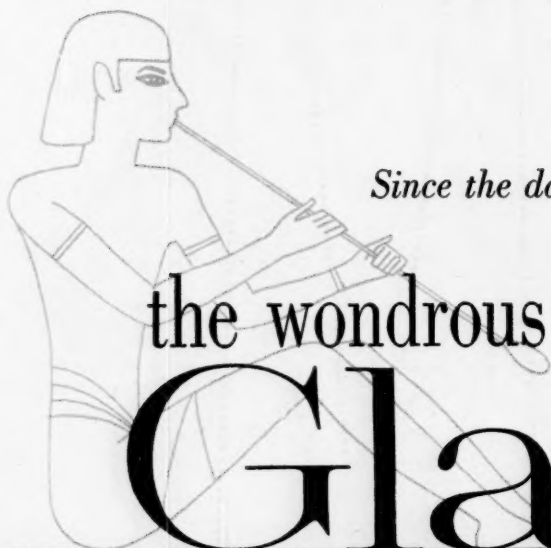
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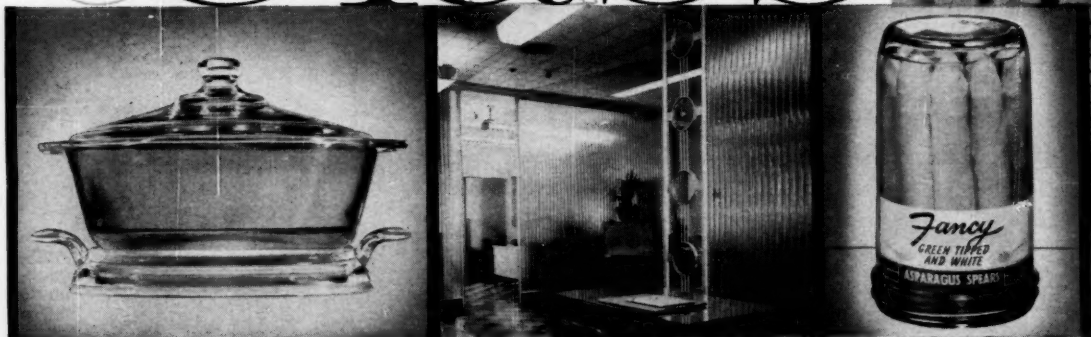
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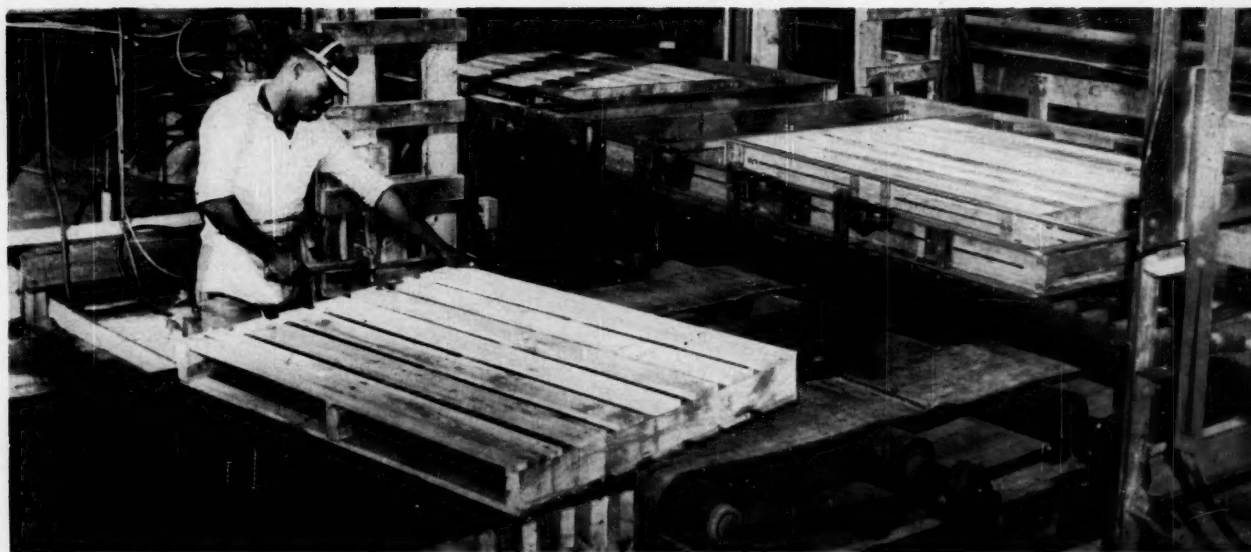
Glassmakers have been doing wondrous things with glass since the ancient Egyptians first developed the art. Today, the Industry is creating new ideas in glass that fire the imagination of designer and user alike... that solve a myriad of production problems from fiber glass curtains to upside-down containers for asparagus, from flameware to decorative flat glass. The adaptability—the ageless utility—of glass products account for their tremendous growth and bright future. Helping glassmakers maintain end-product quality is a prime responsibility of AMERICAN POTASH & CHEMICAL CORPORATION, producers of consistently pure, uniformly dependable TRONA® SODA ASH, a prime ingredient in glass of all types. If you're faced with problems, in product or process, that better raw materials and better service might solve, we suggest that you get in touch with your TRONA representative today.



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Nailing is now used to assemble pallets and wooden boxes. But box and pallet makers see . . .

6-Million-Pound Opportunity for Adhesives

Producers of wooden pallets and boxes would like to abandon nailing, switch over to adhesives in the fastening operation. But lack of suitable adhesives is balking the switch. And glue manufacturers have shown little interest in the broad problem. The potential market for their products, however, is sizable.

Pallets consume 1.23 billion board-ft. of lumber annually; and wooden boxes take about 4 billion board-ft. a year. The total accounts for about 12% of all U.S. lumber consumption. Figuring pallet production at 50 million/year, the maximum market for adhesives in pallets would be over 3 million lbs./year. This total assumes 2.2 sq. ft. of glue line/pallet and 30 lbs. of adhesive/1,000 sq. ft. of glue line.

The market potential for adhesives in wooden boxes would probably be at least 3 million lbs. This would be in addition to the adhesives now used in edge-gluing of narrow strips to form wide box panels.

Weak in the Joint: Box producers would like to avoid nailing because the nailed joint is the weakest part of the box. Box men believe that gluing would permit the use of thinner and cheaper secondary grades of lumber;

tare weight and labor costs would be reduced and quality requirements for cleats would be lowered.

Pallet producers reason further that gluing would eliminate splitting caused by stresses and strains that develop when the pallet dries out. And gluing should prevent product damage from protruding or "popped" nails.

Both wooden box and pallet makers have been hit by the onslaught of low-cost paperboard products. Thus, the cost-saving potential of gluing looms as a strong incentive for seeking a satisfactory adhesive.

Barrier: But the switch from nails to adhesives is hindered by technical problems. Pallet producers need a glue that works on green wood (25-40% moisture content) and needs virtually no press or clamp time. Wooden box fabricators present this list of requirements for a suitable glue:

- High water resistance.
- Short clamp time.
- High initial strength and quick set.
- Wood penetration (to 1/4 in.).
- It must fill gaps.
- Adaptability to a wide range of manufacturing conditions.
- Adhesion to wood of 12-18% moisture content.

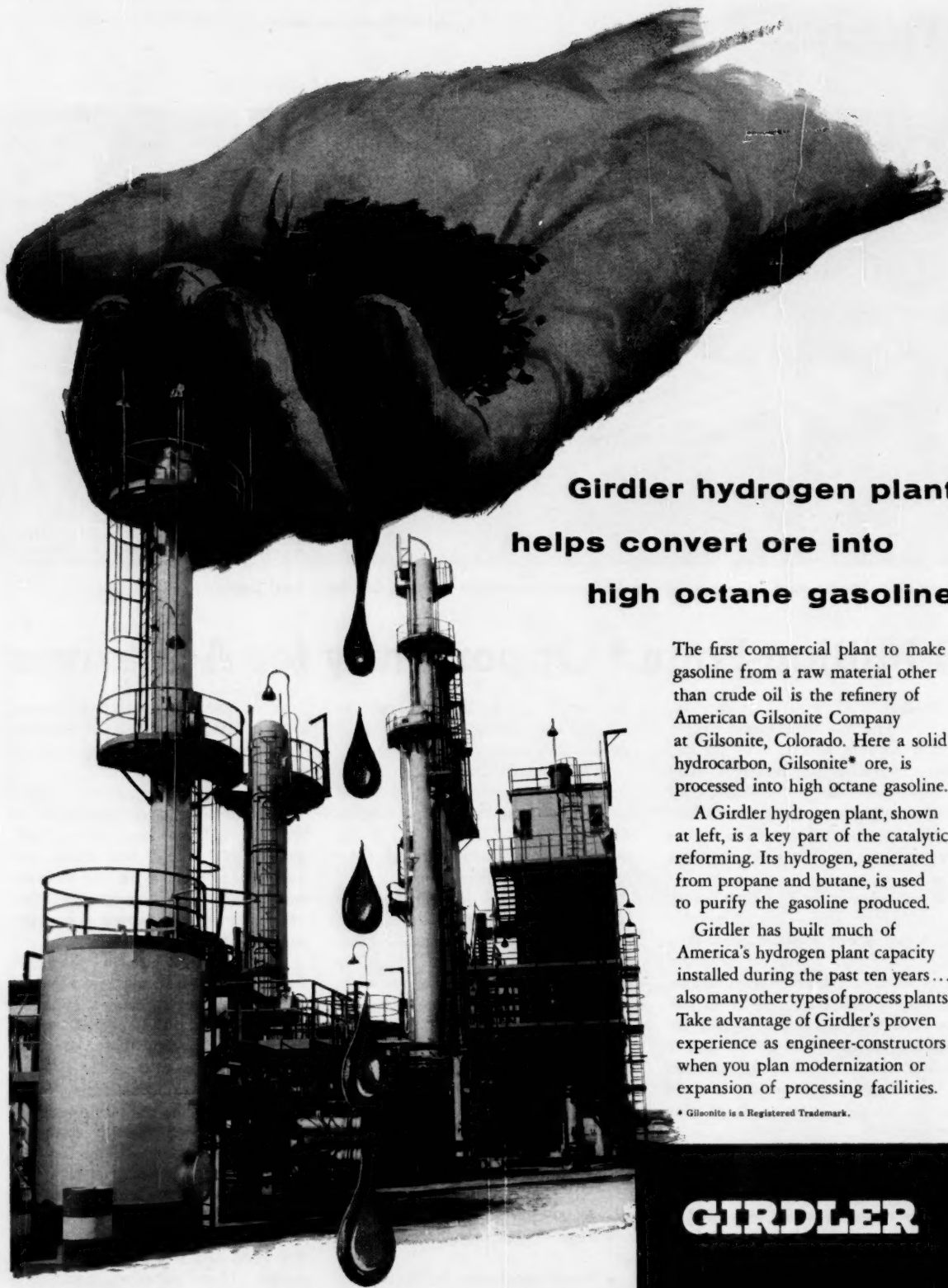
• And to be favorably considered, a glue should not require extensive alteration of current manufacturing processes.

Glue cost, surprisingly, doesn't make the list. Many (especially in the box industry) feel that a high-priced glue would find eager customers if it met all the requirements noted above. But no currently available adhesive has proved completely satisfactory.

All adhesives, except neoprene-based contact cements, run afoul of the green-wood stipulation. But the contact cements are hobbled by low shear strength, which bars pallet use. Casein adhesives have only fair water resistance and lack high initial strength. Animal glues require clamping and are sensitive to moisture. Phenol and resorcinol adhesives are ruled out, in the opinion of many, by too much sensitivity to box-manufacturing variables.

Polyvinyl materials require a fairly dry wood and are not very water-resistant. Urea adhesives require a medium-long set time (unless heated) and their moisture tolerance is not completely satisfactory.

Not Hopeless: But the problem, say adhesives experts, is far from hope-



Girdler hydrogen plant helps convert ore into high octane gasoline

The first commercial plant to make gasoline from a raw material other than crude oil is the refinery of American Gilsonite Company at Gilsonite, Colorado. Here a solid hydrocarbon, Gilsonite* ore, is processed into high octane gasoline.

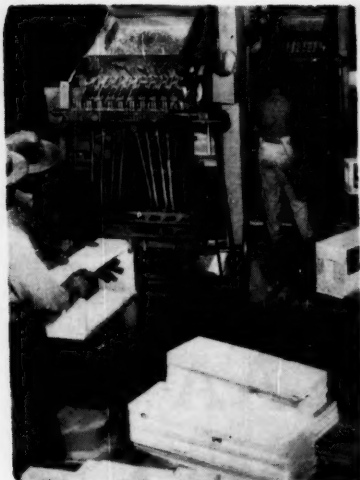
A Girdler hydrogen plant, shown at left, is a key part of the catalytic reforming. Its hydrogen, generated from propane and butane, is used to purify the gasoline produced.

Girdler has built much of America's hydrogen plant capacity installed during the past ten years... also many other types of process plants. Take advantage of Girdler's proven experience as engineer-constructors when you plan modernization or expansion of processing facilities.

* Gilsonite is a Registered Trademark.

This Girdler hydrogen plant is part of the catalytic reformer installation of American Gilsonite Co., built by H. K. Ferguson Co.

GIRDLER



In wooden boxes, multimillion-pound potential market for adhesives.

less. Research—especially on urea, resorcinol and phenol-resorcinol resins promises to yield results. Urea resins are especially promising because of their extreme versatility in formulation; optimism over resorcinol and phenol-resorcinol types stems from recent research indicating that they work on much wetter wood than was heretofore supposed.

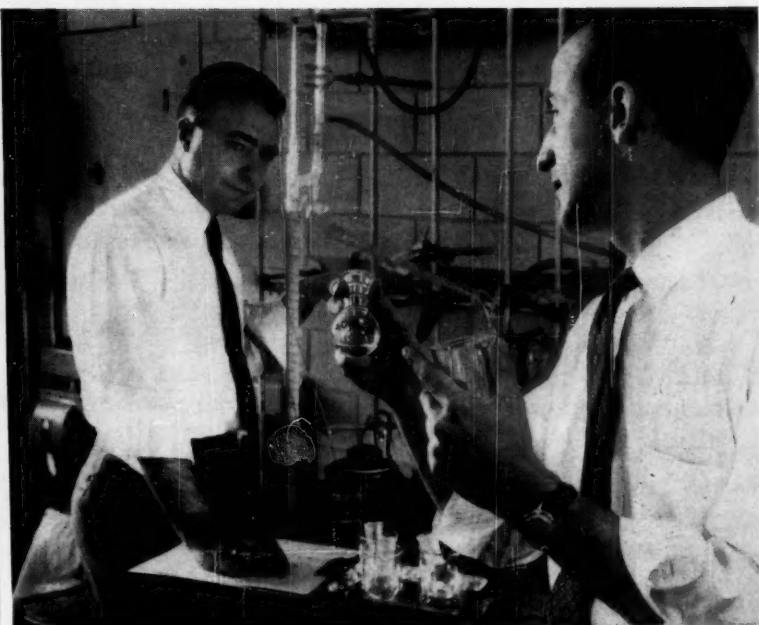
Another approach is found in shock-absorbing adhesives. They might eliminate the difficulty of utilizing green lumber—problem here involves high stress and strain that results from drying.

Adhesives producers feel that present glues could be modified to work with special machinery but that pallet and box people are reluctant to adopt such machinery. Wood fabricators, on the other hand, claim that profit margins don't permit new methods; they feel that little research has been done on their problem.

This is the background against which adhesives research is getting under way:

Pallet producers will sponsor a project at the New York State College of Forestry (Syracuse University). The National Assn. of Glue Manufacturers is seeking improvement for animal glues at Polytechnic Institute of Brooklyn. And some glue producers are interested in a cooperative venture with pallet and box makers.

A market of some 6 million lbs. a year of adhesives is the potential payoff of research.



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Depend on it—the caprylic acid content of GROCO 26 Stripped Coconut Fatty Acid never exceeds 0.5%. The capric acid content is reduced to less than 6%. The caproic is removed completely. Composition —

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Capric acid	5.5%
Lauric acid	50.0%
Myristic acid	23.0%
Palmitic acid	6.0%
Stearic acid	2.0%
Oleic acid	11.0%
Linoleic acid	2.0%

Also important—the amount of each component in GROCO 26 Stripped Coconut Fatty Acid never varies by more than $\pm 5\%$ of the specified amount. Lauric content is higher than you find in competitively priced acids. Color is lightest. Odor blandest. Heat stability and shelf life are outstanding.

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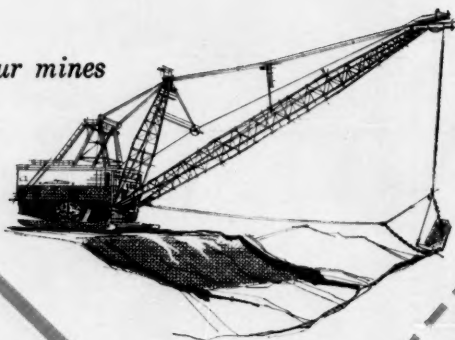
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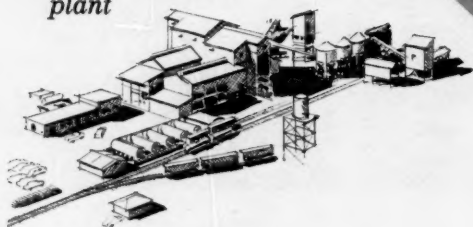
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Technology

Newsletter

CHEMICAL WEEK

December 21, 1957

Celanese and National Lead will join research forces on stereospecific polymerizations. National Lead has been quietly working on some new catalysts, has come up with some that, according to Celanese, "constitute an important breakthrough toward successful production of unique polymers, including radically new types of polypropylene and polystyrene." Programs at National Lead's labs in Sayreville, N.J., and Brooklyn, and at Celanese labs in Summit, N.J., are getting under way.

Neither firm is saying very much about the catalysts, but both state that certain organotitanium compounds look very promising. National Lead, of course, has done considerable amount of work on organotitanium compounds, mostly esters (*CW*, March 3, '56, p. 64). One possibility for the new series of catalysts: sandwich compounds similar to ferrocene, dicyclopentadienyl iron (*CW Technology Newsletter*, Feb. 18, '56).

A significant aspect of the new research effort: Celanese, which operates a linear polyethylene plant using a Phillips license, is taking a different tack for research on the bigger monomers.

•
A new method of making graft polymers has been developed by the French Societe Polyplastic. It's based on pretreating the polymers with ozone, followed by graft-polymerizing vinyl, vinylidene and diene monomers, induced by the ozonized polymers.

Use of the technique, it's said, permits a variety of new resins, different from the so-called "transfer"-graft polymers resulting from use of monomeric polymerization catalysts. It can be applied to surface-grafting on finished polymeric articles. For instance, synthetic fibers made from polyacrylonitrile, polypropylene or polyethylene can be made dye-receptive by such treatment. Shaped polymeric articles can also be modified. Dow Chemical already has an option on a license for certain aspects of it.

•
A way to put an alkyl group in the ortho position on a phenolic compound has been worked up by R. Stroh, R. Seydel and W. Hahn of Farbenfabriken Bayer. It utilizes aluminum, one part of which reacts with 100 parts of phenol (or a cresol, chlorophenol, hydroquinone). The aluminum compound is then reacted at 120-140 C with an olefin. Temperatures are lower and reaction quicker with growing length of olefin chain. Yields are generally over 70%.

The Bayer researchers feel that the technique is important for a number of syntheses of wetting agents, antioxidants and other compounds. Their work is reported in *Angewandte Chemie* (Nov. 21).

•
Propulsion utilizing ionized gases has been measured for the first time. Vernon Blackman, senior research scientist for Giannini Research

Technology Newsletter

(Continued)

Laboratory, reported at a recent meeting of the Advanced Propulsion Symposium in Los Angeles that specific impulses as high as 600/second have been obtained with helium as the working fluid. He added that specific impulses as high as 1,000 can be achieved by increasing the input energy. Giannini has an Air Force contract to study ion-propulsion behavior (*CW*, Oct. 12, p. 156).

•
A laboratory fire at Britain's Atomic Weapons Research Establishment Dec. 11 killed a senior experimental officer, slightly injured six assistants. They are engaged in top-secret work, and news of the accident was not released for 48 hours. The accident involved a small metallurgical furnace. There was no explosion, and the metal being processed was not radioactive.

•
Results of some early polio vaccine tests must be released. In response to a plea by Cutter Laboratories, a federal court judge at Baltimore has ordered the U. S. Public Health Service to make available any information it has on the Cutter vaccine.

However, he refused Cutter's request to release information on vaccines made by other manufacturers. Cutter may appeal this, since tests of other vaccines could be the firm's key point in its defense against a \$365,000 damage suit. Now being tried in Oakland, Calif., it involves two children who contracted polio after receiving Cutter's product. Cutter wants to find out whether USPHS found live virus in Cutter vaccine only after devising more sensitive tests than those prescribed for manufacturers. It also wants to learn whether fair samples from other producers were tested.

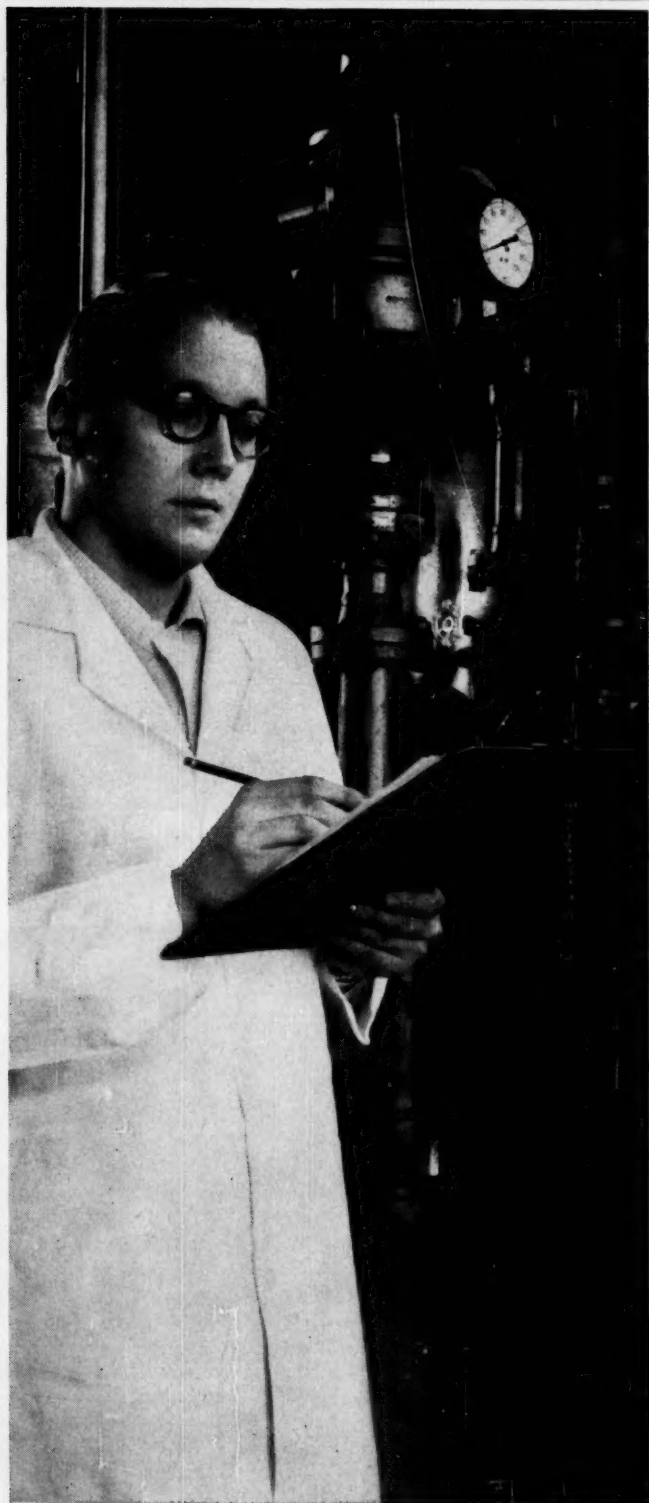
•
Corning Glass's Pyroceram manufacturing method may be sketched in broad strokes in a recent Australian patent application. Application 28,144/57 by Corning Glass Works describes making crystal and semicrystal ceramics. The method involves the treating of a glass batch containing 2-20% titanium dioxide as the nucleating agent along with other inorganic compounds.

•
A plant to make prilled potash is in operation following a difficult shakedown. Bonneville Ltd. reports that the wrinkles in its Wendover, Utah, operation have been ironed out and that the plant is running smoothly. It was started up in Oct. '56.

The firm is now selling the prilled material at the same price as regular and granular potash: 36¢/unit of K_2O contained in muriate of potash, f. o. b. And it is continuing work on the recovery of by-products from its potash brines. President William L. Bradley says only that "progress has been made, but there is still much work to be done." Best guess now is that it is trying to obtain some type of lithium product from its solar evaporation ponds.

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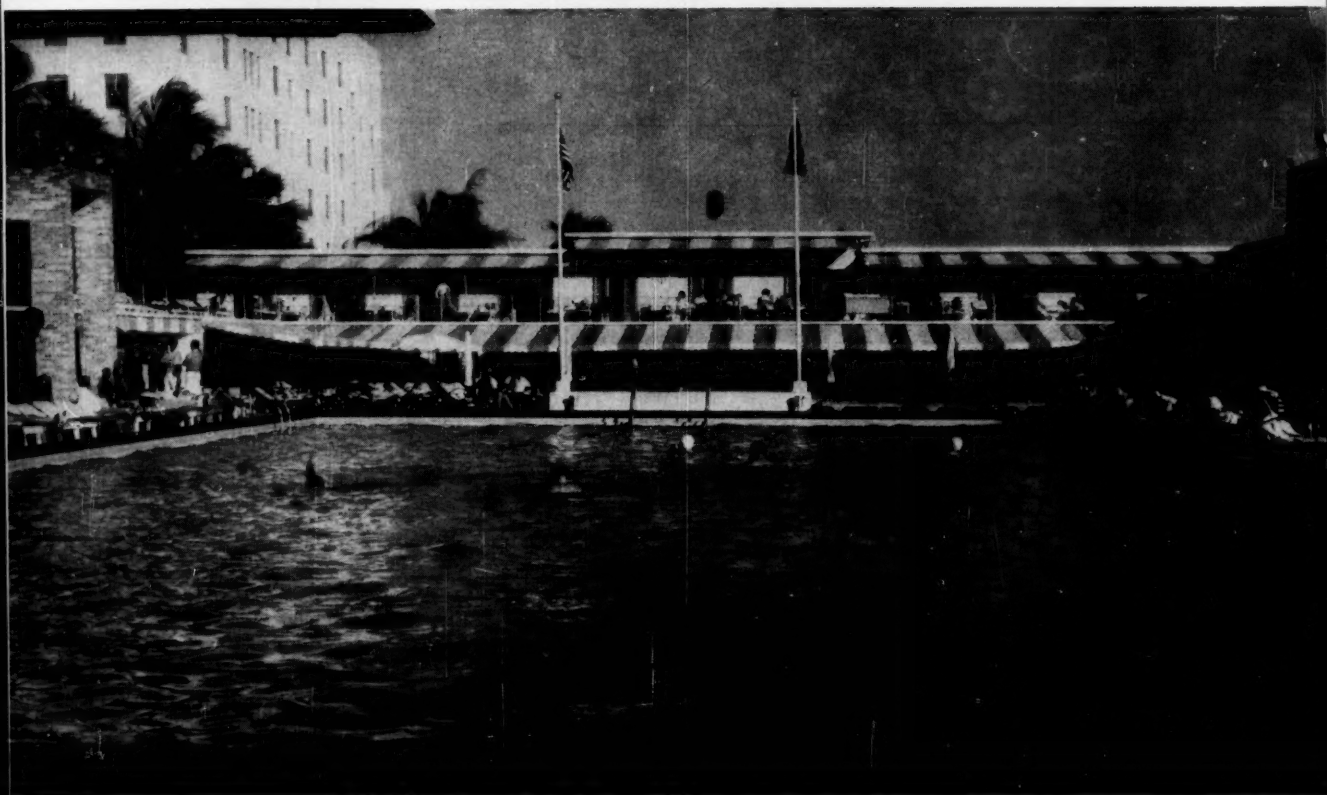
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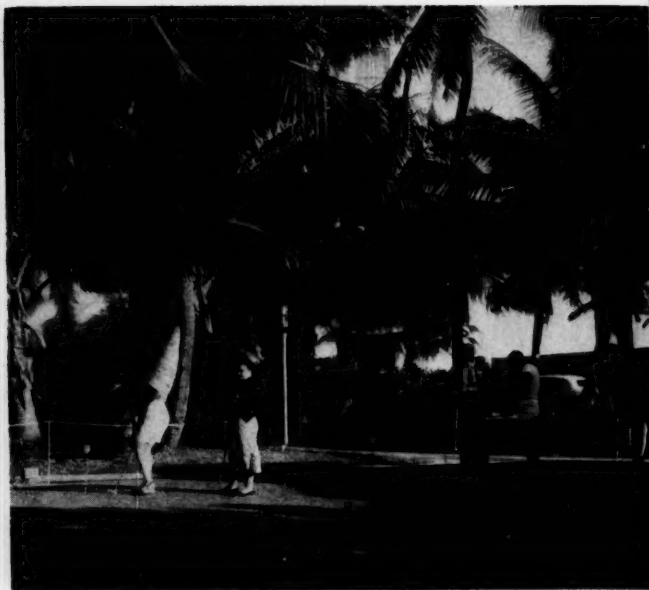
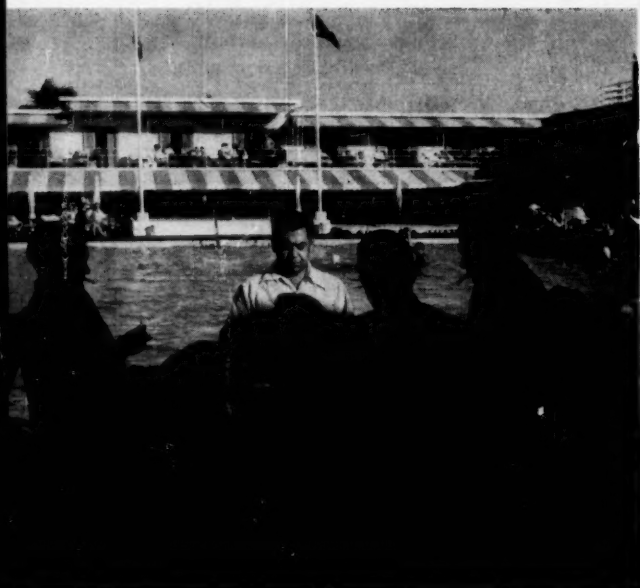
THE NAME TO REMEMBER FOR QUALITY BACKED BY YEARS OF RESEARCH AND EXPERIENCE

December 21, 1957 • Chemical Week

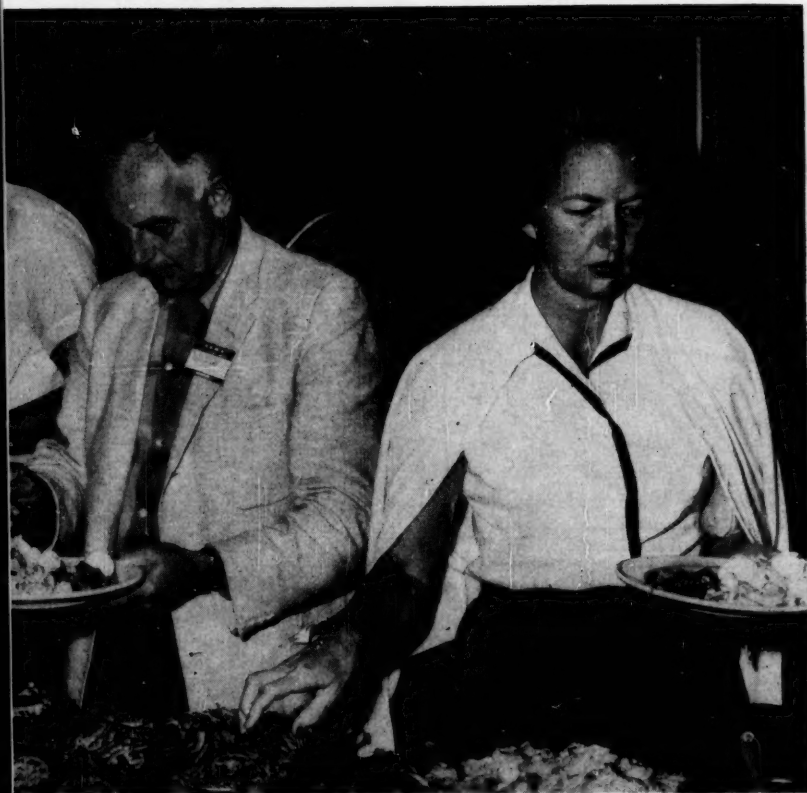
SPECIALTIES



At last week's Chemical Specialties Manufacturers' Assn., no day was too busy to rule out a swim.



For relaxation between sessions, golf or cards rated high with many of the 700 attendees.



At buffets, and cocktail parties, members talked of specialties' '58 prospects, found them good.

Specialties Makers Rally

Seven hundred top-management men in the specialties industry trekked to Florida's Hollywood Beach Hotel last week for the 44th annual meeting of the Chemical Specialties Manufacturers' Assn. Despite the 60 F weather and nine-to-five scheduling of association business, they managed to squeeze in plenty of sunning, swimming and golfing at the four-day conference.

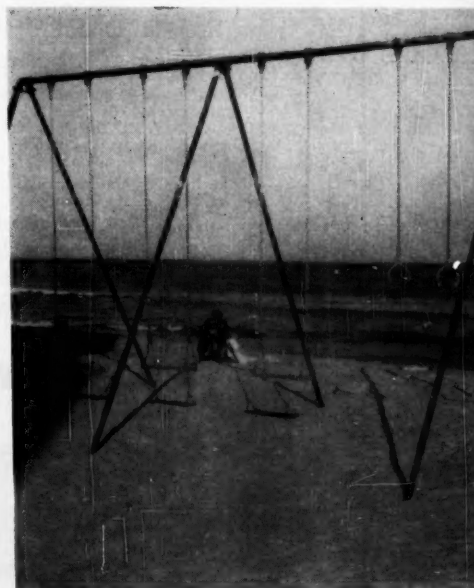
Highlights of the sessions were three of the CSMA's surveys on '56-'57 product sales (see p. 50); highlights of postsession get-togethers at buffet table and shuffleboard court were speculations on '58's prospects. Consensus about the future: sales at about the '57 level for most specialty items next year; profits reduced somewhat. Brightest optimism was shown by the association's aerosol group—it's talking about tripling production in the next five years if food aerosols catch

on with the general public.

Pressure Packagers' Progress: Ebullient aerosolers, more and more the prime movers at CSMA sessions, estimate that volume of aerosol production should climb from the estimated 375 million units produced in '57 to around 400-415 million in '58.

If food pressure-packaging takes hold, spokesmen say, it will add another 11 million to the projected '58 figure. Pharmaceutical aerosols should also help swell this volume too — pool-side talk was that within the near future the market for these drug items may reach \$150 million.

Market Proof: The CSMA released survey figures on several segments of the industry. Its just-completed study of auto radiator specialties shows that U.S. manufacturers turned out at least 33 million consumer-size units of chemical cleaners for auto



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SPECIALTIES

cooling systems last year. That's enough to treat 55% of the nation's 60 million registered passenger cars and trucks. The production of cooling system sealers in '56 hit 26,097,547 units. Production of radiator inhibitors was 4,124,835 units; output of combination water-pump lubricant and rust inhibitor compounds was 14,687,812 cans. Bulk production of the combination water-pump lubricant and rust inhibitor compounds totaled 42,449 gal.

In the automotive wax and polish field, at least 43.6 million consumer-size cans of cleaning-polishing compounds were produced in '56 (*CW Business Newsletter*, Dec. 14). (This total does not include straight wax products and chromium cleaners.) Last year's wax polish production was only 9,638,345 units. Liquids accounted for about two-thirds of the '56 production—paste products made up the rest.

Antifreeze—3% Growth: But there were predictions as well as surveys—e.g., antifreeze makers can expect to make sales of 103 million gal. in the '57-58 winter season, according to CSMA reports. Of this, about 82 million gal. will be glycol-based fluids. For the future, the antifreeze market should show a minimum growth rate of 3%/year, experts say.

Synergised Residual: Although few products were launched at this year's CSMA meeting, Du Pont did report on a new twist in the formulation of its methoxychlor insecticide. It has found that the synergist sesoxane, which is primarily a synergist for pyrethrins, also appears to improve the effectiveness of methoxychlor, a chlorinated, residual bug killer.

CSMA elected new officers at this session. James E. Ferris, manager of Inorganic Chemicals Division of Hooker Electrochemical Co., got the post of president. Other officers selected were: first vice-president, Donald M. King, President of Masury-Young Co. (Boston) and second vice-president, George W. Fiero of Esso Standard Oil Co.

Named to three-year terms on the association's board of governors were Charles E. Beach of John C. Stalford and Sons, Inc. (Baltimore); Charles E. Allderice, Jr., of The Bell Co. (Chicago) and Harry E. Peterson of Peterson Filling and Packaging Co. (Danville, Ill.).

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What's its name? FLUOROLUBE®. It's a high-density addition polymer of trifluorovinyl chloride. The basic polymer can be fractionated into many grades, ranging from low-viscosity colorless oils through heavy oils to opaque greases. All have excellent lubricating qualities.

What can you do with them? Some suggestions: lubricate ultraprecision instruments; seal pumps, valves, pipe joints in equipment handling oxygen, hydrogen peroxide, nitric acid, and other corrosives; lubricate PVC fittings, plug cocks, vacuum pumps in highly corrosive service.

You'll find other ideas on use, plus specifications and typical properties, in a data file on FLUOROLUBES which you can get by checking the coupon.

Phosphoric anhydride

Every now and then another new use is discovered for phosphoric anhydride, P₂O₅.

This OLDBURY chemical has much to offer if you're looking for a strong drying agent or a high-purity condensation agent.

One of the strongest known desiccants, P₂O₅ contains no sulfates, and only 2 ppm chlorides. Its purity, 98% min., is a distinct advantage in one of its major uses—as a condensing agent in making clear methacrylate resins.

Among the interesting applications for P₂O₅ is a recently developed use in a uranium extraction process.

If you'd like to know more about versatile phosphoric anhydride, for now or later, just check the coupon.

Hypophosphites, N.F. grade

If you use hypophosphites in your own processing, you'll be interested in these three reasons for choosing OLDBURY® hypophosphites:

1. There's a wide selection. Three of the most commonly used are mentioned below.
2. They're high-purity materials, produced in stainless steel equipment. Those listed below all meet N.F. requirements, assaying 98% min.
3. They're readily available. In at least one case, Hooker is your sole U.S. source.

Calcium hypophosphite, Ca(H₂PO₂)₂, finds use in medicinals and in organic syntheses. It forms soluble salts, so it is a highly effective means of retaining phosphorus in solution.

Potassium hypophosphite, KH₂PO₂, is also used in pharmaceutical manufacture.

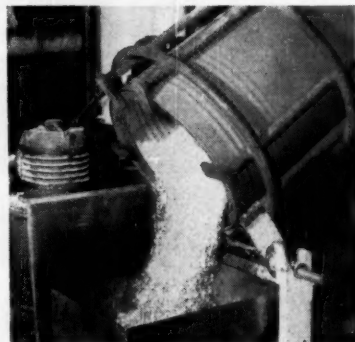
Sodium hypophosphite, NaH₂PO₂·H₂O, is a strong reducing agent and antioxidant. Its uses, actual or potential, include: deamination *via* reduction of diazo derivatives; inhibition of rancidity in flour, meat, and other foods. A commercial grade for electrodeless nickel plating is also available.

These three hypophosphites are shipped in fiber drums, 25 to 50 lbs. net. For complete information on any of them, just check the coupon.

Save time handling sulfides in new fast-pouring drum

You'll like the way you save time with this new 400-lb. drum in which you can now purchase Hooker sodium sulfide and sodium sulphydrate. Your operators will like its convenience, too.

The opening is 18 inches in diameter—four inches wider and 65% larger in area than the former container.



Easier to empty This drum is much easier to empty with a scoop or shovel. It saves time when pouring, too. Flakes don't pile up around the opening when the drum is inverted.

There's no increase in price for the new drum. To get this extra convenience, just specify Hooker sodium sulfide or sodium sulphydrate on your next order.

For more information on chemicals mentioned on this page, check here:

- | | |
|--|--|
| <input type="checkbox"/> FLUOROLUBES | <input type="checkbox"/> Sodium Sulfide |
| <input type="checkbox"/> Calcium Hypophosphite | <input type="checkbox"/> Sodium Sulphydrate |
| <input type="checkbox"/> Potassium Hypophosphite | <input type="checkbox"/> Phosphoric Anhydride |
| <input type="checkbox"/> Sodium Hypophosphite | <input type="checkbox"/> New list of products—Bulletin 100-A |

Clip and mail to us with your name, title, and company address.
(When requesting samples, please use business letterhead.)

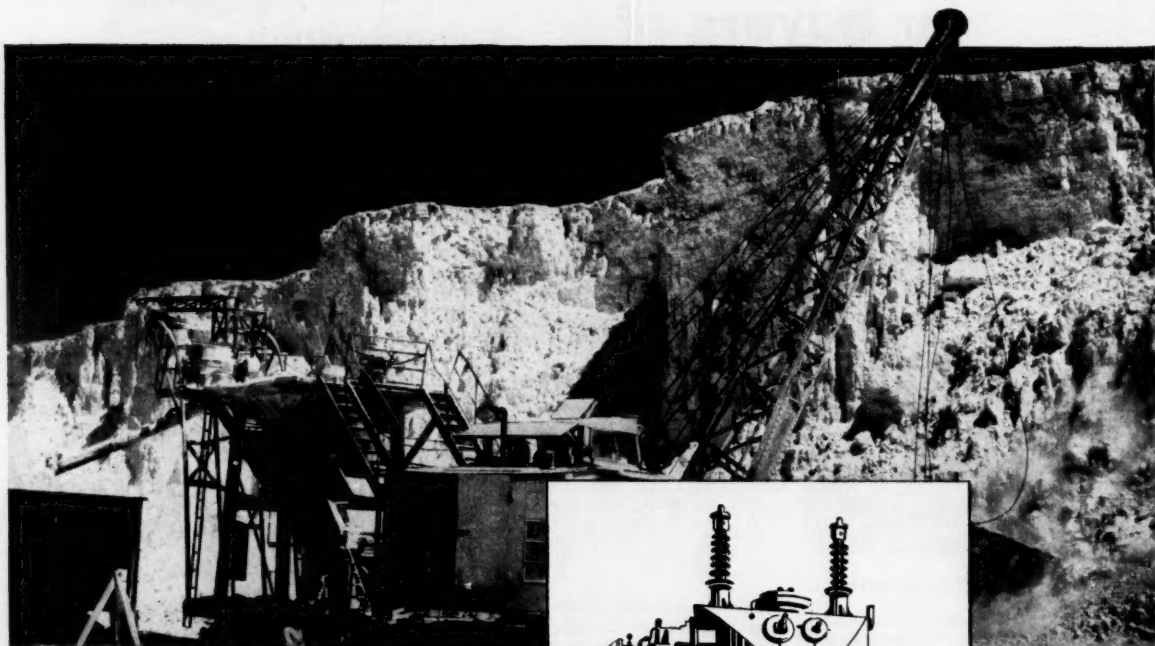
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Los Angeles Philadelphia Worcester, Mass.
In Canada: Hooker Chemicals Limited, North Vancouver, B. C.

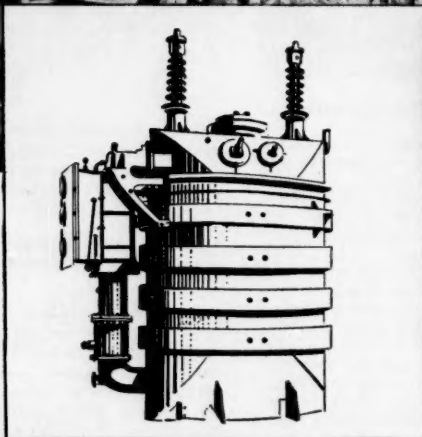


SULPHUR *helps to create Headline Products*



SF₆

*A new concept in
transformer
insulation*



GAS INSTEAD OF OIL... *that is headline news!*

Sulphur Hexafluoride is a heavy, non-flammable gas and is both chemically and physiologically inert. These characteristics plus its high dielectric strength pin-pointed the heavy duty transformer field as a logical target. And so it turned out!

SF₆ instead of oil is now being used in high voltage transformers with the following advantages:

- operations are much quieter
- lighter construction permissible
- less restriction in location
- lower maintenance
- fire-proof and explosion-proof

In SF₆, the electrical and electronics industries are finding a very useful product providing both electrical insulation and cooling. As in so many 'headline' products serving industry, the element S is part of the chemical structure!



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Market Newsletter

CHEMICAL WEEK

December 21, 1957

The holiday-sparked easing in current market activity isn't likely to change price increases already announced for first-quarter schedules. And the number of hikes to be posted is impressive. Chief reasons, of course, have been mounting costs of production, transportation, containers and raw materials. Those, at any rate, have been the complaints heard most often in '57.

To those reasons borax and boric acid marketers add higher labor and fuel costs to explain the need for upcoming increases. The acid tags will go up \$4.50/ton, push price of crystals to \$133.50/ton, granular material to \$108.50/ton. Both quotes are bags, c.l., f.o.b. works.

For borax, c.l. anhydrous prices will move up to \$87.50 a ton, granular decahydrate to \$47.50, granular pentahydrate to a higher \$63/ton.

Some barium chemicals will also cost more. Barium carbonate, for example, will be increased by \$5/ton, to set a new c.l. price of \$111.50/ton (bags, f.o.b. works). A similar \$5 advance will apply to l.c.l. quantities of anhydrous and crystal barium chloride. The former's new price will be \$196/ton; on the crystals, \$160/ton.

Prices on several pigments also will be altered on Jan. 1, and the changes will be up, not down, as reported last week. Changes announced by American Cyanamid and others will include: para-toners advancing to \$1.21/lb.; sodium lithol increasing from 98¢/lb. to a higher \$1.03; barium and calcium lithol moving up to 98¢ (a 5¢/lb. increase). Alkali blue toners will be hiked to \$1.28-1.36/lb. (depending on quantity), compared with the present range of \$1.20-1.28.

Sharp price cuts on lithium chemicals provided the biggest pricing news last week. American Potash & Chemical's action—knocking 20¢/lb. off hydroxide and 6¢/lb. off carbonate tags—may have widespread lithium market implications. Probable: more than one lithium producer will re-evaluate his current standing in the trade (*see also p. 20*).

The reductions bring lithium hydroxide prices down from 75¢/lb. to 55¢ on contract tonnages (c.l., delivered); down to 56¢ in l.c.l. amounts. Both prices are effective immediately and will become industry-wide. AP&CC's lithium carbonate was reduced to 67¢/lb. from a previous 73¢ (c.l.), but the change won't be effective until Jan. 1.

Thallium prices were also undercut substantially late last week. The slash (first cut in seven years) brings American Smelting and Refining's price down \$5/lb., to set a new low of \$7.50/lb. The rare metal, extracted as a by-product of lead refining, is used in a number of outlets (e.g., the metal to lower melting points of alloys; the sulfate as an insecticide and rodenticide).

Market Newsletter

(Continued)

Reason for the price reduction: "to broaden the thallium market," says the major producer.

Ammonium nitrate consumers will face a split price in the new quarter. Most producers are indicating that they will stick with previous announcements to advance schedules to \$72/ton (a \$4 increase), but some, reportedly, will post a \$70 tag.

Ammonium nitrate business hasn't been too brisk lately (though production of fertilizer grade is running much higher than it was a year ago), and the combination has trade followers guessing as to which price will become industry standard. Best bet: the higher tag will start off the new year—it's the figure some of the larger makers will quote.

How did pesticide chemicals do in '57? Total sales, reports the National Agricultural Chemicals Assn., reached some \$250 million this year, just about matching the record high attained in '56.

Where is it all going? Says the association: about 60% of the industry's sales are to farmers, 20% to nonfarm users (including home gardeners) and 20% are to overseas customers.

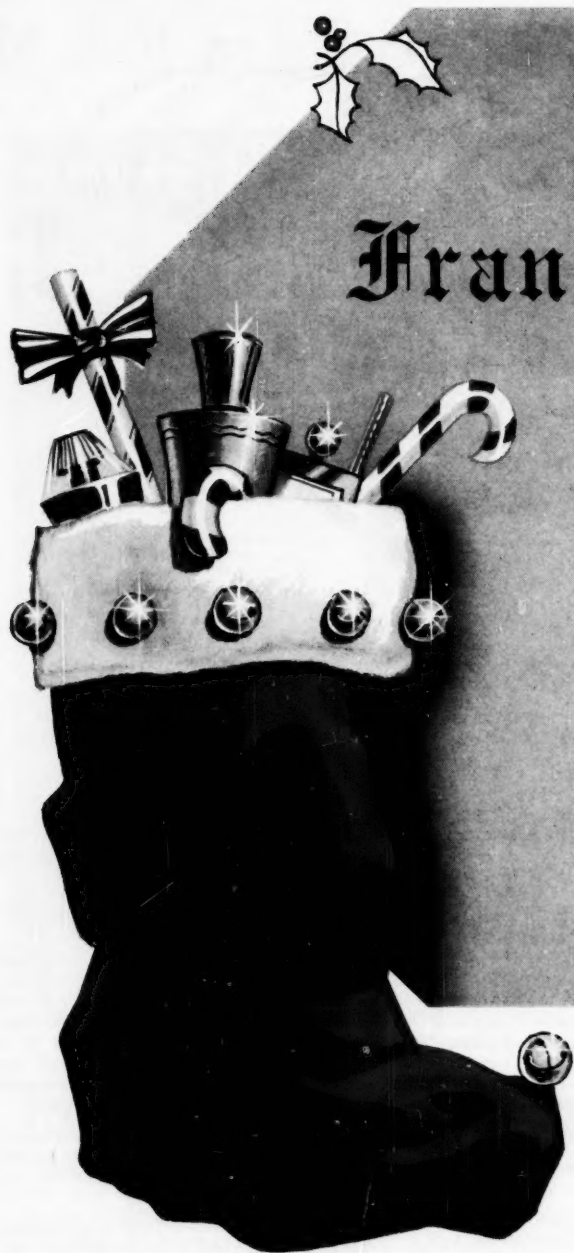
Here's an indication of urethane growth. Dow has started tank-car-quantity production of seven new resin-grade polyglycols tailored to meet the urethane industry's "requirements for starting-materials of exacting quality." There's a polyglycol for just about every polyurethane need, including those for flexible foams and elastomers, rigid and semirigid foams and coatings.

Hint to U. S. cellophane sellers—cars in cellophane bags are the latest innovation on the German automobile market. Goggomobil baby cars are being delivered (on request) in such covering. It's said to protect chromium and lacquer during shipment from plant to customer.

SELECTED PRICE CHANGES—Week Ending December 16, 1957

	Change	New Price
UP		
Coconut oil, crude, tanks, New York	\$0.005	\$0.1475
o-Phenylphenol, dms., l.c.l., works	0.02	0.44
Stannic oxide, dms., dlvd. E.	0.015	1.01
DOWN		
Ammonium acetate, purif., dms.	\$0.01	\$0.40
Lithium hydroxide, monohydrate, dms., c.l., t.l., frt. alld.	0.20	0.55
Thallium metal, dlvd.	5.00	7.50
Thallium sulfate, 99%, bots., dlvd.	3.00	5.00

All prices per pound unless quantity is stated.



Frankincense and Mirth!

Penick's diversified line is brimful of good things for the holidays!

Frankincense for liturgical use. And myrrh, too, used in incense and perfume.

Indeed, many gifts of perfume will be scented with Penick fragrances. Tons of ice cream, candy and other confections will be consumed, much of it flavored by Penick! Cocktails will be enhanced by vermouths and more potent beverages made with Penick-imported herbs and juniper berries.

If the holiday roast is a mite tough, a bit of tenderizer based on Penick's papain will help. But chances are poultry is on the menu . . . a fatter, healthier bird because of Penick antibiotics and our new anti-picking spray. Egg nogs and whipped cream may be richer and purer because our dairy sanitizer keeps dairies sparkling and cows more contented. Fruits and vegetables are prettier and more plentiful because of our insecticides.

And whenever the feasting is overdone, there are excellent remedies to relieve distress . . . incorporating Penick medicinals, of course!

In all, we hope your holidays will be bright and cheerful and your new year prosperous.

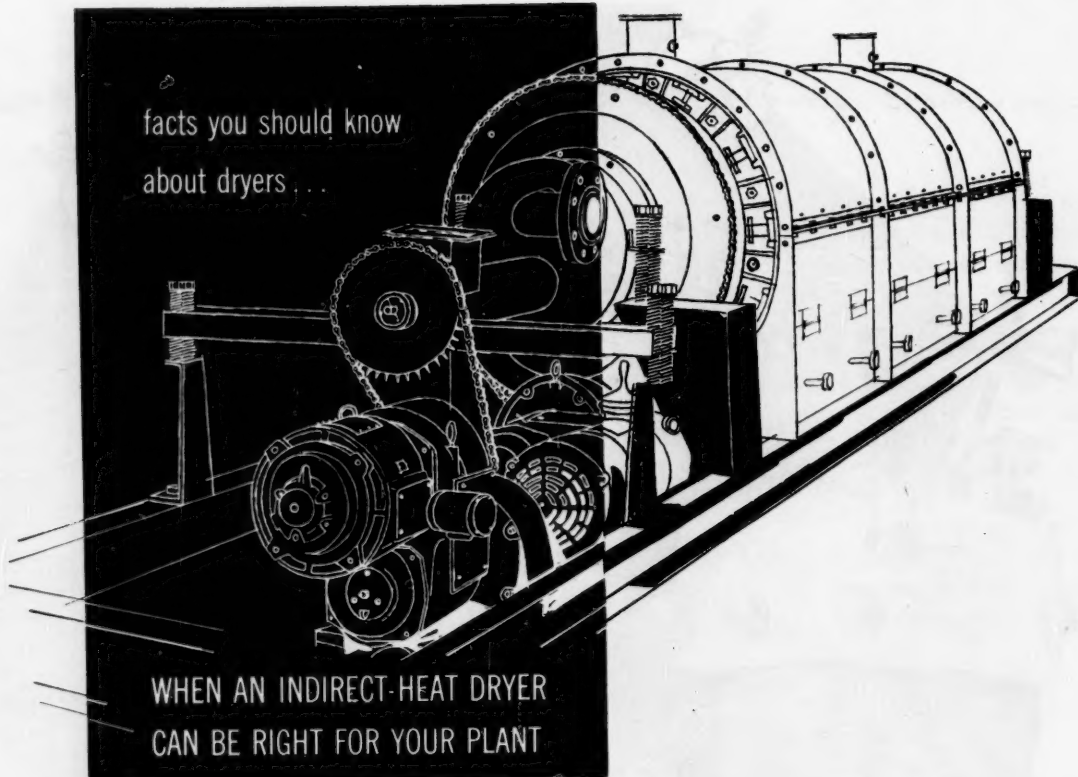
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facts you should know
about dryers . . .



WHEN AN INDIRECT-HEAT DRYER
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For over 55 years, Louisville Dryers have been solving industry's drying problems and effecting marked economies. The records of this experience can often be applied to specific cases, possibly yours. For example . . .

Q. *My material is a filter cake, practically all minus 325 mesh, and must not contact furnace gases. It can be heated to 500° F. at least, without injury. What type of dryer would do the job best?*

A. You might consider using a direct-heat rotary dryer that utilizes clean, heated air as the drying medium—air heated by steam coils or a gas or oil fired heat exchanger. However, this introduces a considerable dust collection problem. Besides, from a standpoint of capacity, it is inefficient as well as from a heat-cost standpoint. This makes it unduly expensive. Therefore, a type of indirect-heat rotary dryer is indicated which would greatly reduce both the

dust problem and the heat cost.

Q. *What is meant by an indirect-heat rotary dryer?*

A. One in which the material to be dried is warmed by contact with the heated metal surfaces, which in turn are heated by the medium used (usually furnace gases or steam). Those using furnace gases are called "indirect fire dryers". Atmospheric and vacuum drum dryers are examples of steam-heated indirect dryers, but the type in greatest use is the steam tube dryer. This is often referred to as the "Louisville Type" because of the thousands of Louisville Steam Tube Dryers built during the past 55 years.

Q. *How does an indirect-heat dryer minimize the dust problem?*

A. In an indirect-heat dryer, only enough air is admitted to carry off the evaporated moisture. Thus, the air has nothing to do with the heating

of the material. Generally, this low air velocity results in insignificant dust loss.

Q. *How does this differ from the operation of a direct-heat dryer?*

A. In direct-heat dryers, the hot air furnishes the heat for drying besides removing the evaporated moisture. The amount needed to supply the necessary heat results in a sufficiently high velocity through the dryer to carry out an excessive amount of fine material particles.

Q. *It seems I need an indirect-heat dryer. How can I get competent advice and more information regarding my particular requirements?*

A. The Louisville Dryer engineering staff will be glad to analyze your requirements, arrange for necessary pilot plant tests, and submit an unbiased recommendation accompanied by estimated costs. You incur no obligation by using this service.



LOUISVILLE DRYING MACHINERY UNIT

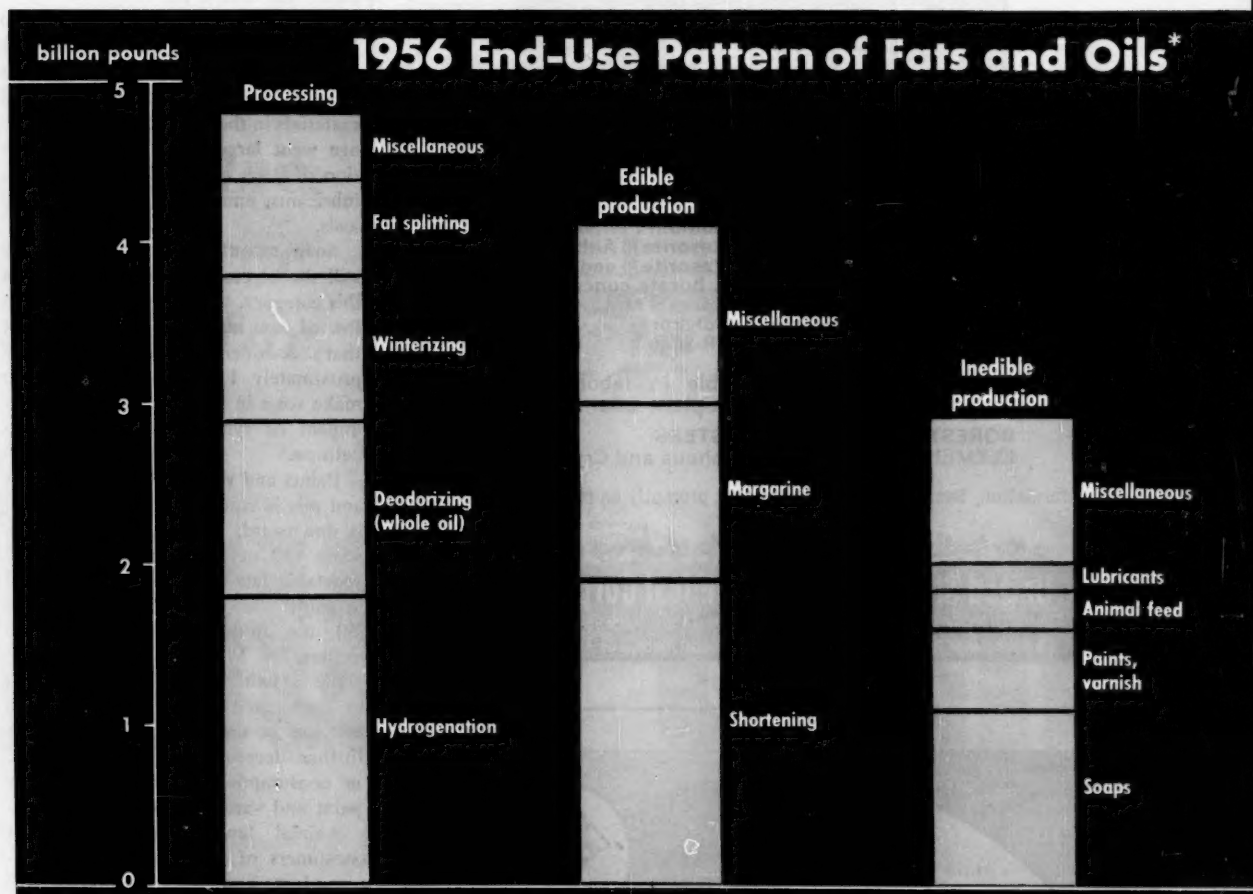
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End-Use Shifts Bolster Fats and Oils Demand

Despite persistent gloomy predictions that U.S. production of fats and oils is outpacing demand, producers this week are looking to Jan. 1 and the future with cautious optimism. Reason: factory consumption of primary and selected secondary vegetable and animal fats and oils continues to climb, will easily pass the 12-billion-lbs./year mark by the end of '57.

That's a small but encouraging increase over the 11.8 billion lbs. used in '56—the latest official figure reported by the U.S. Dept. of Commerce. And these classifications do not include fats and oils used in refining—another growing outlet that consumed an additional 6.5 billion lbs. of fats and oils in '57.

*Factory usage of primary and selected secondary animal and vegetable fats and oils other than that used for refining.

Behind this rising demand for fats and oils, there has been, in the past few years, a shift in end-use patterns. This change shows up in all three of the major areas of fats and oils consumption—the processed products (the largest portion), the "edibles" and the "inedibles."

Process Pickup: In '56, for example, of the 4.8 billion lbs. of fats and oils that were deodorized, hydrogenated, winterized†, or modified in some way, 1 billion lbs. were deodorized whole oil. This is a whacking 230% increase over the '54 mark of 0.3 billion lbs. Why the surge? Market followers say U.S. housewives are using increasing amounts of liquid cooking oils in preference to so-called shortening.

†Oils (e.g., salad oils) modified so they don't solidify in cold weather.

This trend also helps explain the steady decline noted in consumption of hydrogenated animal and vegetable oils. Last year, some 1.8 billion lbs. of fats and oils were hydrogenated in the U.S.—significantly less than the peak volume of more than 2 billion lbs. so treated in '54.

Edibles Hearty: There's little change in the demand for margarine and shortening, which together account for almost 3 billion lbs. of the more than 4 billion lbs. of fats and oils used in all edible products in '56. Demand for shortening was over 1.8 billion lbs., but slightly less than the 1.98 billion lbs. reported for '55.

On the other hand, factory consumption of fats and oils for making margarine hit an all-time high of 1.1 billion lbs. in '56—in '50, the amount

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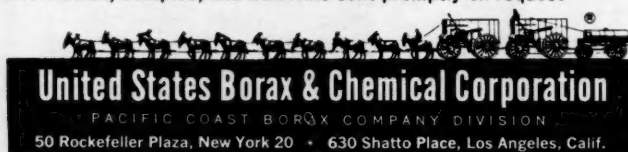
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MARKETS

used for this purpose was a relatively small 0.8 billion lbs.

Inedibles Set Back: There has also been some shifting in the inedibles category of fats and oils, which covers close to 3 billion lbs. of the natural materials in the '56 listing. This poundage went largely for factory production of items such as soaps, paints, lubricants, animal feeds, resins, chemicals.

Soap manufacture, of course, is still the biggest fats and oils outlet in this category, took more than 1 billion lbs. of raw materials last year. But that's considerably less than the approximately 1.9 billion lbs. used to make soap in '50. Behind the plunge: impact of synthetic detergents competition.


Paints and varnish demands for fats and oils is considerable, but the trend is downward. In '56, for example, some 482 million lbs. of animal and vegetable fats and oils were consumed in paint and varnish production; in '50, the amount was closer to 600 million lbs. Main reasons for the decline: a switch from oil-based paints to latex-based paints. And continued increase in use of latex paints spells further decreases, say paint experts, in consumption of fats and oils by paint and varnish makers.

Animal feeds, already important consumers of fats, have a bright future. Just how fast this market will grow is moot, but one industry estimate is for a total demand of 400 million lbs./year of fats in the "near future." That's almost double the 244 million lbs. of fats and oils used in feeds in '56.

Other outlets for factory consumption of inedible fats and oils include manufacture of resins, chemicals, pharmaceuticals, rubber products. Demand by each of these outlets is holding up well*.

U.S. producers of animal and vegetable fats and oils aren't overly concerned about the changes in demand. But they're keeping a sharp eye on over-all factory consumption patterns—which show signs of continued healthy growth, especially in those plants that manufacture chemical and allied products.

*Because of an error in reporting, government fats and oils statistics show greater consumption of these materials in '54 than in '56. Commerce Dept. spokesmen concede the error, caution that '54 data under the "other inedible factory consumption of fats and oils" category should not be compared with '55 and '56 data.



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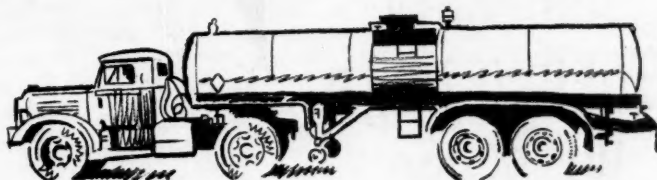
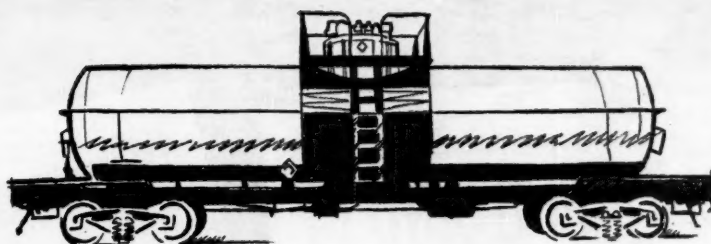
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DISCOVER THE NITROPARAFFINS

RESEARCH



Ultrafast spectrometer is new research tool. Here, developer William Wiley is . . .

Setting Speed Record for Chemical Analysis

The man in the picture is squinting into the eyepiece of a new device that completes chemical analyses in a split second. It's the first of its kind to be offered commercially, permits identification of molecules created or consumed in reactions as speedy as the explosion of a rocket or burning of automotive fuels.

Dow and three other chemical firms already own prototypes. Now the first commercial model, built at Bendix Aviation Corp.'s Cincinnati division, is about ready for shipment to the U.S. Bureau of Standards.

Called a time-of-flight mass spectrometer, the new analyzer was developed at Bendix's Detroit research labs by physics department head Ian McLaren and chief physicist William Wiley (Bendix has patents and applications covering the device). Analyzer costs \$15-25,000, depending on the model; identifies gases, vaporized liquids and solids (including metals) by revealing their molecular masses.

Radar-checked Speeders: Heart of the new instrument is a 4-ft. metal vacuum tube called an ion gun. Ionized molecules of the compounds being analyzed are squirted like radar

signals from one end of the tube to the other. Their speed ("time-of-flight") is measured electronically. Ions appear as a wave pattern, or spectrum, on an oscilloscope. Lighter ions move faster than heavier ones, appear at different positions on the abscissa (time scale) of the oscilloscope. Relative position of the ions on the scope—Bendix offers a comparative chart of "knowns"—determines their chemical nature. Relative height of each peak formed by the ions determines the amount of each present.

Key to the instrument's analytical speed (0.0001 second) is the use of radar techniques to pulse the positive and negative ions down the tube in frequencies to 10,000 times/second. As a result, the instrument provides—for the first time—a means of analyzing the many intermediate molecules produced in virtually instantaneous chemical reactions, for example, explosions.

Too, Bendix believes its new device will help isolate and identify corrosive intermediates formed in the combustion of fuel in almost any type of power plant (including nuclear reactors, internal combustion engines). It

could thus be applied to research for corrosion preventives.

Jet Speed Analyses: It probably will be used for analyzing fuel combustion in turbo- and ram-jet engines and for study of materials having high-temperature stability (e.g., missile nose cones, ceramic, and glass). And it is slated to become commonplace, Bendix believes, in controlling processes for refinery products, plastics, synthetic chemicals, metal alloys, detergents and pharmaceuticals (and in pharmaceutical research).

Bendix claims anyone trained in spectroscopy will have no trouble in operating its new device. That's not to imply, though, that time-of-flight spectrometers aren't complicated and interesting subjects for research and development themselves.

Isotope Flight Time: The University of California Radiation Laboratory (Berkeley) also has developed an instrument that utilizes the time-of-flight principle. However, it is not primarily intended for use in chemical analysis. The university's instrument is used to measure ion sources that are solids, is intended primarily to separate isotopes of a sample. Many of the



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RESEARCH

latter samples come from University of California's cyclotron.

Unlike the Bendix instrument, U.C.'s device operates continuously, is not pulsed. It was designed by William Glenn, made by Manard Michel, and patented by the Atomic Energy Commission (in Glenn's name).

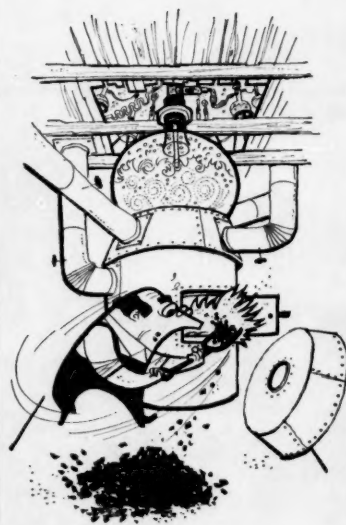
General Electric also uses the time-of-flight principle in a device it designed for leak detection. But researchers agree that the Bendix instrument is a neat, new apparatus that should offer fast solutions of a lot of long-standing problems.

REPORTS

These reports are available from the U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.:

- "Bonding of Polyethylene" (PB 131099, \$1) tells how chromic acid can be used to improve the normally poor bonding properties of polyethylene. The chromic acid treatment provides a chemical bond, so that polyethylene adhesives depending primarily on their permanent "tackiness" (as do most currently used products) are unnecessary.

- Some new Atomic Energy Commission chemical research reports: A Survey of Metal Solubilities in Zinc (72 pages, \$2, ANL-5753); Properties of Some Refractory Uranium Compounds (34 pages, \$1, BMI-1223); Freezing Point Determinations of the Uranium Hexafluoride - Hydrogen Fluoride System (14 pages, 50¢, GAT-213); Uniform Aqueous Corrosion of Aluminum—Effects of Various Ions (53 pages, \$1.50, HW-50133); Review of the Joint AECL-KAPL Studies of the Transuranium Elements (35 pages, \$1, KAPL-1781); F-18 Exchange Between Fluorocarbons and Some Fluorine-Containing Compounds (117 pages, \$3.25, ORNL-2363); The Solvent Extraction of Iron With Tri-n-octylphosphine Oxide (19 pages, 75¢, ORNL-2382); Reactor Chemistry and Plant Materials, Bettis Technical Review (142 pages, \$4, WAPD-BT-3, volume 1, No. 3); Separation of the Boron Isotopes, National Nuclear Energy Series Division 3, Volume 5 (485 pages, \$7, TID-5227); Symposium on the Reprocessing of Irradiated Fuels Held at Brussels, Belgium, May 20-25, '57, Books 1, 2 and 3 (1,165 pages, TID-7534, \$10.50).



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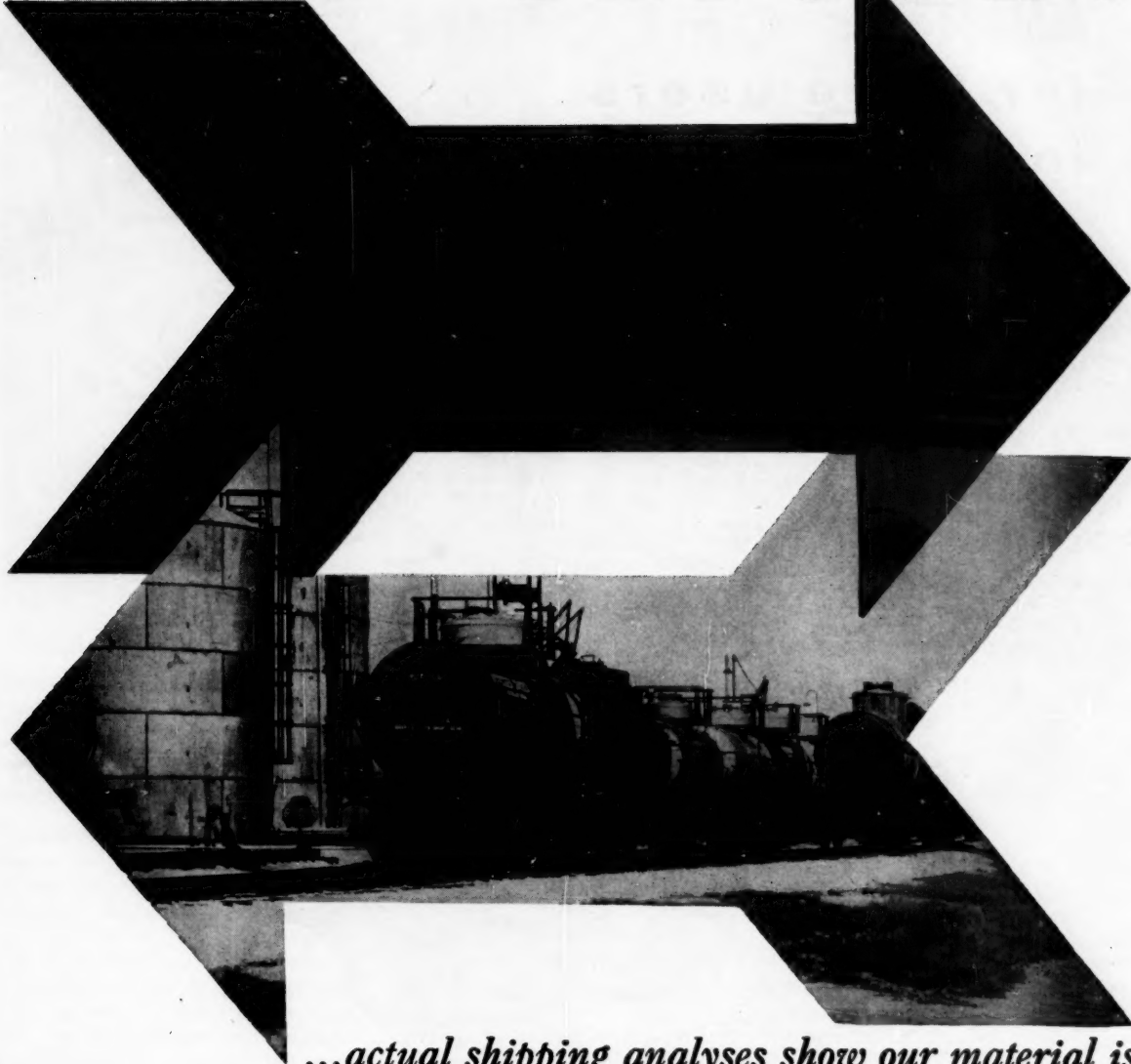
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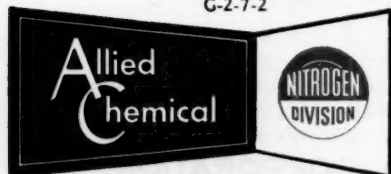
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Piret (left) and Toplin give AIChE conferees an engineer's-eye-view of Russian engineering as . . .

Engineers Size Up Soviet Opposite Numbers

How do Russian chemical engineers stack up against their American counterparts? If training is a good criterion, they are well off, according to University of Minnesota Professor Edgar L. Piret and J. G. Toplin, of Standard Oil Co. of Indiana. Their reports were highlights of the study of foreign engineers and engineering techniques presented last week at the meeting of the American Institute of Chemical Engineers in The Conrad Hilton Hotel in Chicago.

Piret, recently returned from a State Dept.-sponsored trip to Russia, outlined the wide extremes in Soviet achievement for the 2,500 U.S. engineers at the meeting. He summarized the picture as one of peaks and valleys—the former in technology and certain areas of state interest and the latter in individual comforts—he rode from Berlin to Moscow with a magazine separating him from a broken spring in the seat of his modern turboprop plane.

The Russian educational system is

weighted heavily in favor of the engineer, with nine institutes, exclusively for chemical engineers, throughout the Soviet Union. The two located in Moscow—Mendeleev Institute of Chemical Engineering and Moscow Institute of Chemical Equipment Design—have a combined enrollment of over 6,000 undergraduates.

Piret documented his first-hand observations of these institutions with numerous photographs (he was allowed free use of his camera). Most outstanding difference between Soviet schools and those in the U.S.: lavish use of plant-like instrumentation in student labs.

Piret feels that Soviet engineering is benefiting from such expenditures for education, says that the Russian chemical engineer is approaching the traditional practicality of the American engineer more rapidly than is his West European counterpart. Not all his listeners were convinced that elaborate labs are the answer, though. Overheard on the elevator: "I'm glad to see them worrying about fancy instrument

boards; it helps take up time and keeps them from learning anything important."

Educational Scale-up: Toplin—a native of prerevolution Russia and a specialist in Russian engineering progress—agrees with Piret that Soviet engineers have gained considerable experience in process design, are fast overcoming their previous difficulties in translating research results into large-scale plant production. One of the important changes in the educational system that have helped the engineer, says Toplin, is the shift from superspecialization to more general, basic subjects, giving him more flexibility.

Both speakers attested to the large volume of Russian technological students. Statistics cited: Russia graduated 71,600 engineers in '56, compared with 23,000 graduated in the U.S. in '55. It's estimated that 50,000 Russian students are majoring in chemical engineering—about 40% of them women. In fact, women make up about half the scientific profession-



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ENGINEERING



SD's Landau: German CPI must be sold on value of chemical engineers.

al class, directing research projects in chemistry and engineering and frequently managing important engineering work.

Reward in Rubles: Another important index of Soviet emphasis on technology is the financial incentive offered. According to Piret, the experienced engineer gets about 3,500 rubles/month (or about four times the pay of the average Russian factory worker).

And teachers make good wages; a professor draws 6,000-11,000 rubles a month. American reluctance to compensate university teachers on this scale is a big factor contributing to our current engineering shortage, according to retiring AIChE President J. Henry Rushton, Purdue University professor. Quality—not quantity—of engineering manpower is the most acute problem we have to face, he says. His proposed solutions: larger educational appropriations (from non-federal sources) upgrading of technical instruction.

Germans Frown on ChE's: In another report on chemical engineering abroad, Scientific Design Co.'s Ralph Landau said there is no chemical engineering profession in Germany. German industry is unconvinced that chemical engineers can do as good a job as the German team of chemists and mechanical engineers (aided by plenty of trained technicians).

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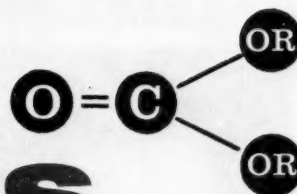
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Dow's Pierce: Information flow is vital to efficient, economic piloting.

areas is shown by German acceptance of a new kind of specialist: the process engineer (*Verfahreningenieur*) about 1,000 of whom are scattered throughout German industry. Not highly trained in chemistry, they are employed in all German process industries.

According to Landau, German industry believes it shouldn't try to compete with American firms on the basis of productive capacity. Rather, it makes the chemist boss, feels that its welfare rests on research. German firms, he says, feel they must continue to pioneer new processes and products to keep their place in the world chemical picture.

Other speakers on West European chemical engineering—Purdue's J. E. Myers (who covered Great Britain), Olin Mathieson's Aaron Rose (France), University of Kansas' J. O. Maloney (Italy)—were pretty well agreed that chemical engineering education is struggling under lecture systems better suited to turning out basic scientists. The result: engineers with a relatively theoretical approach to problems. And the few engineers trained in the American tradition are not always employed effectively because their training is a relative novelty.

Process Highlights: New uses for nuclear heat, new metal-extraction techniques were among other topics of special interest. A new application of nuclear energy described by AEC's R. Carson Dalzell and USBM's

James P. McGee is coal gasification. Experimental work by the bureau, they report, has demonstrated the feasibility of gasifying low-rank coals (sub-bituminous and lignite) at temperatures in the 1800 F range. Essentially, the process involves heating steam and finely powdered coal inside alloy-steel tubes with recycled helium. The method could also be used for the gasification of higher-rank coals, say Dalzell and McGee, by raising the operating temperature to 2000 F or higher.

The impending commercial-scale production of pure beryllium metal—another offspring of the burgeoning nuclear industry—was touched upon by Beryllium Corp.'s Kenneth B. Higbie.

In a paper coauthored by Max C. Farmer, of National Academy of Sciences, Higbie outlined processing methods employed in the production of conventional beryllium compounds and alloys. In reply to a question from the audience, he declined to go into details of preparing the pure metal, would say only that magnesium reduction of a beryllium fluoride "looks better" than reduction by the electrolytic method.

A boost for tantalum recovery was described by D. F. Taylor, of Fansteel Metallurgical Corp. He suggested a two-step method of going from potassium fluorotantalate (K_2TaF_7) to a suspension of tantalum in aluminum-copper alloy. In the first step, the tantalate is induction-heated to 1100 C with aluminum in a graphite crucible to yield an aluminum-tantalum alloy. This product is then treated with copper (also at 1100 C) to produce the suspension of tantalum metal, which is recovered by dissolving the aluminum-copper alloy in acid. Advantages of the new route: considerable reduction of equipment costs; increased recovery — near-theoretical yield. One drawback of the process, however, is its requirement of a recovery system to reclaim relatively costly copper from waste products.

Plant Economics: Planning pilot-plant operations was the subject of one of a number of papers aimed at the economic aspects of engineering. Dow's J. E. Pierce showed how process economics, market goals, patent situation must be studied before pilot experiments are undertaken. He em-

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GE's Gutoff: Cost control is part of the engineering function.

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Hints on pilot-plant operations were given by N. Fragen, K. C. Peterson and G. H. Weisemann, of Standard Oil Co. of Indiana. Their first rule: "Whenever possible, the pilot-plant stage of development is bypassed altogether." This is the recommended plan when design experience and product samples are available for a proposed new project. But if a pilot plant is necessary, the authors give three more basic rules:

- Use standard equipment.
- Keep it as small as possible.
- Build integrated plants only when

intermediate products are unstable; separate units are easier to evaluate.

Cost control is also an engineering function, as pointed out in a paper by Reuben Gutoff, of General Electric's Silicone Products Dept. He outlined his department's 6-year-old program: After cost reduction budgets and policy have been set, a cost reduction team is organized. Direction is supplied by an advisory council headed by the plant superintendent. The working groups, eight "idea" teams made up of a cross-section of plant personnel, meet monthly. Stimulating individual participation: careful selection of team members, assignment of specific jobs, assurance of recognition for good work.

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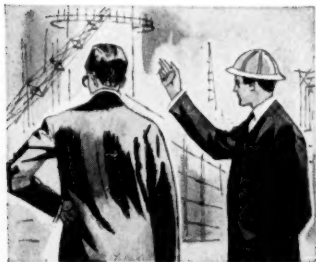
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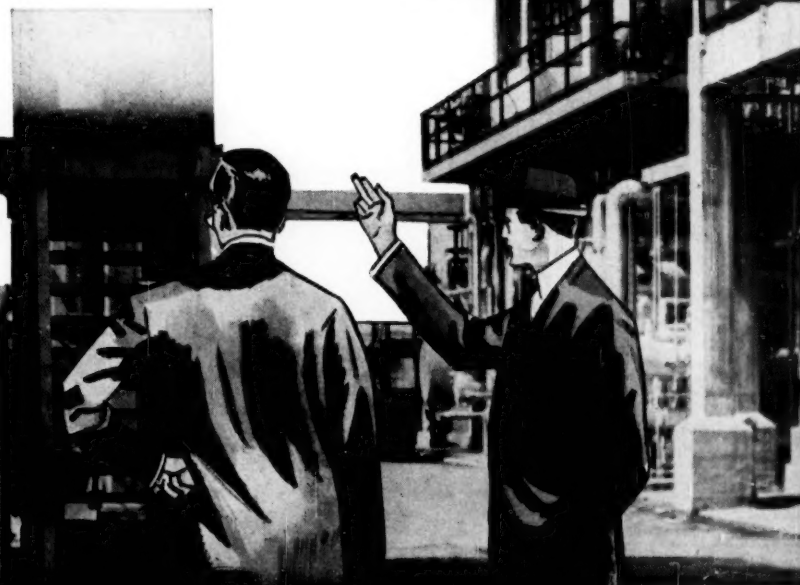
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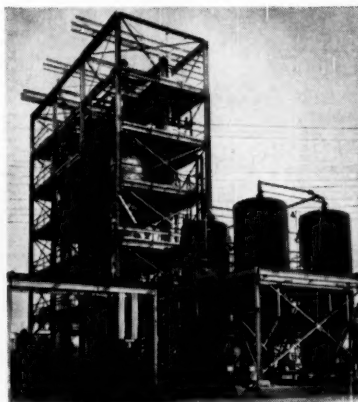
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